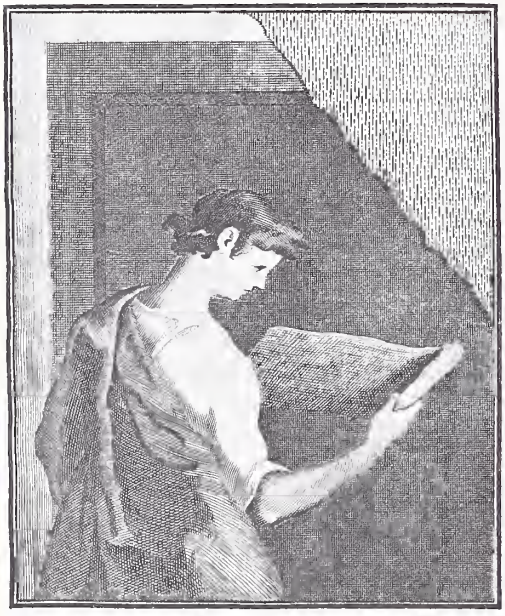

PORTRAIT STUDY.

(Negative by Adolph Meyer.)

From Half-Tone Block by
C. ANGERER & GÖSCHL, *Vienna.*

THE

BRITISH LITHOGRAPHER.

Vol. IV.—1894-5.

LONDON:

RAITHBY, LAWRENCE & CO., LTD.,

1 IMPERIAL BUILDINGS, LUDGATE CIRCUS, E.C.

INDEX TO VOL. IV.

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OUR FOURTH VOLUME

COMMENCES with this issue, and in bringing it to the notice of our friends, we would heartily thank subscribers for the support extended to the past year's issues. We believe that all our promises regarding this volume have been fulfilled, and that as regards keeping readers well abreast of the times in trade matters, in assisting and encouraging young workers, in advising more experienced ones, and generally endeavouring to practically represent the great body of lithographers and kindred craftsmen, the past volume may be looked upon as successful and satisfactory.

We have been gainers by experience, and can assure subscribers of an ever-increasing desire to make their journal worthy of the continued support of all in the trade.

"Actions speak louder than words," and we prefer to let the B.L. speak for itself, rather than make any cheap promises.

Fraternally yours,
THE EDITORS.

+ + + + +

OUR SUPPLEMENTS.

THE FIRST "VALKYRIE"

is a collotype print shewing the famous racing yacht in full sail—a true thing of beauty. How the process lends itself to the production of this class of maritime subject may safely be left to individual judgment. The Rothesay Collotype Co. is responsible for its production, and on another page we give some particulars of Messrs. Adamson and Son, the Collotype Company being practically an offshoot from the famous Rothesay firm of photographers.

THE FRUIT PIECE

presented herewith—practically utilised as a suggestion for a tomato label—is not only a most attractive specimen, but excellently designed and printed in first-class style. As a suggestion it should prove useful, and as an example of the working qualities of Messrs. Manders' inks, the result cannot fail to satisfy the most critical.

THE ARMS SUPPLEMENT

is continued by Plate 9, the printing of the plate again shewing to advantage the inks of Messrs. Gilby & Hermann. It is very satisfactory to learn of the wide appreciation of this series.

The reproduction from

PEN AND INK DRAWING

—a woodland scene—forms a tasteful example of a popular class of study. As a simple rendering of foliage, the sketch may be easily and effectively utilised as a whole or in sections in combination with other designs. The addition of the tint heightens the general effect.

MESSRS. A. B. FLEMING AND CO., LTD.,

have shewn a number of their colours in recent issues of the B.L., and as a continuation of the series, with this issue is presented a well printed design, particularly interesting as shewing the printing qualities of the madder lakes produced by the Edinburgh ink manufacturers.

* * * * *

Printing and Kindred Trades Federation.

CONFERENCE AT NORWICH.

THE custom established some five years ago of holding annual conferences of all the principal trade societies connected with the printing and bookbinding trades has again produced very satisfactory results, this year's meetings being held at Norwich, on Saturday, September 1st, prior to the memorable Trades Congress.

The work at such conferences really resolves itself into a thorough discussion of the customs of the whole combined trades throughout the United Kingdom. Separate cases of infringement of the rules of trades' unions by employers are keenly discussed, and modes of action are determined upon to prevent any recurrence of the same complaints. At this particular meeting, only one such case was reported, and the conference passed a very searching condemnation of the practice and methods under notice.

The conference concluded its business with the re-election of its former officers, viz.: Mr. H. R. Slatter, J.P., president; Mr. D. Sharpe, treasurer; and Mr. Councillor G. D. Kelley, J.P., secretary.

The Condition of Trade.

THE state of trade is not by any means reassuring. It is widely said that trade is improving, and people seem to be somewhat sanguine, but the circumstances do not warrant the assumption, however much it is generally desired.

Speaking generally of the printing trade, the number of unemployed amongst members of societies has increased to 7·5 per cent, and in the details of the trade the reports, with few exceptions, state that trade is only moderate, or bad. These details may be briefly summarised thus:—

BARROW and district	Printing and kindred trades moderately busy.
BOLTON ,,	Printing and kindred trades fairly well employed.
BIRMINGHAM ,,	Printing and kindred trades fairly well employed.
BELFAST ,,	Letterpress printing trade bad; lithographic printing trade fair; lithographic artists very quiet, with disturbing influences.
BRADFORD	Printing trades are quiet.
BRISTOL	Letterpress very slack; lithography improving.
BATH	Printing trades not improving.
ABERDEEN	Letterpress good.
CORK	Letterpress declining.
CARDIFF	Printing trades all bad.
DERBYSHIRE	Letterpress good; lithography moderate; bookbinders five per cent. unemployed.
DUBLIN	Letterpress and lithography very dull, with large numbers unemployed; bookbinders fairly employed.
DUNDEE	Printing trades fairly employed.
EDINBURGH	Letterpress fair in one section, and very dull in another, with increased numbers unemployed; lithography fairly employed; bookbinding dull.
GLASGOW	Letterpress and bookbinding slightly improved; lithography bad.
HANLEY and POTTERIES	Letterpress bad, with nine per cent. unemployed; lithography as moderate as before.
HULL	Printing trades very quiet, seven per cent. unemployed.
LEEDS	Letterpress bad, with large number unemployed; lithography slack, with fourteen per cent. unemployed.
LEICESTER and NORTHAMPTON	Printing trades shew no improvement.
LIVERPOOL	Lithography and bookbinding very quiet; letterpress bad, with ten per cent. unemployed.
MANCHESTER	Letterpress and lithography shew no improvement; bookbinding is a little worse.
MIDDLESBORO' and STOCKTON	Printing trades are very quiet.
NEWCASTLE-ON-TYNE	Printing trades dull, with 8·4 per cent. unemployed; bookbinding quiet.
OLDHAM	Printing trades are slack.
PLYMOUTH and S.W.	Printing trades are steady.
SHEFFIELD	Printing trades are quiet.
WOLVERHAMPTON	Printing trades are worse. Unemployed have increased.

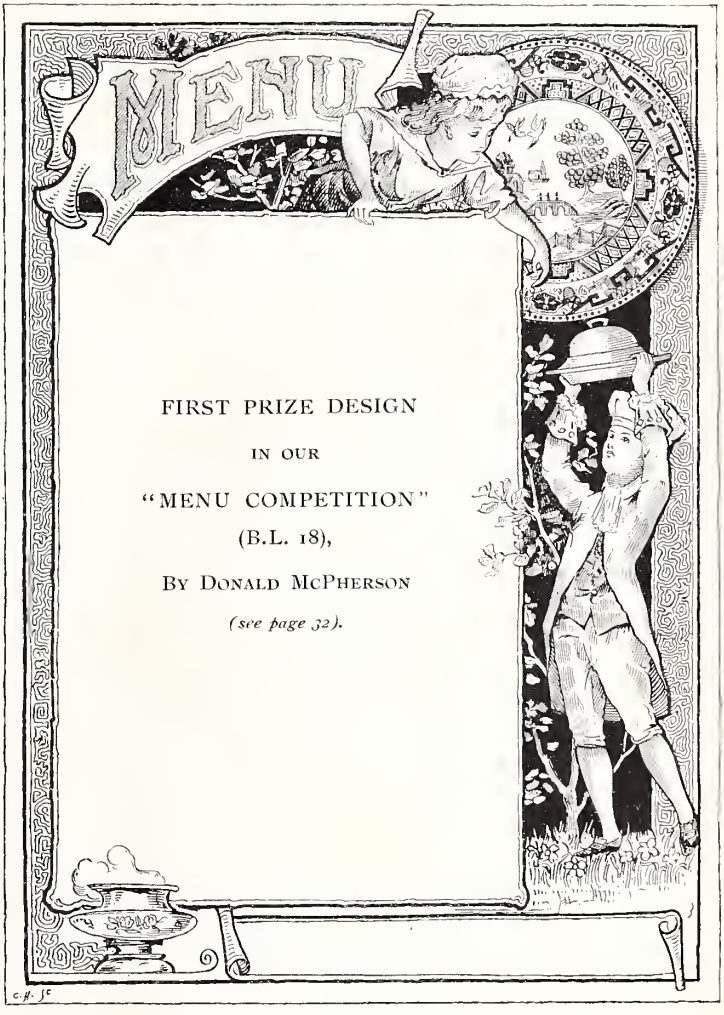
These reports, though very brief, contain quite enough information to shew that the condition of trade is far from satisfactory.

As announced in last issue of B.L., a new edition (the fifth) of "Photo-Engraving, Photo-Litho and Collotype," by W. T. Wilkinson (Morland, Judd & Co., 17 Farringdon-street, E.C.; 5/-) is now being published. Without entering into details previously mentioned, the scope of the work may be gathered from the sections into which the matter is divided. These are: "Taking the Negative," "Zinc Etching in Line," "Photo-Engraving in Half-tone," "Photo-Lithography in Line and Half-tone," "Collographic Printing," "Photogravure." The last section includes a valuable paper on "The Preparation of Drawings for Reproduction," which we specially commend to the attention of artist subscribers sending in sketches for reproduction in our Prize Competitions and illustrated articles. The book possesses the merit of being clearly and plainly written, and the reader is not apt to lose himself in a haze of involved technical explanations. Beginners will find the chapters of every assistance, and experienced workers must acknowledge its value as a well-compiled reference.

REFERRING to our "Book Notes" on page 167, No. 18, B.L., Mr. W. T. Wilkinson writes us that he has had nothing to do with the edition of "Photo-Engraving" mentioned. He says that the book was written by him in 1887, and was two years in the press, and that he has not since revised it.

✧ ✧ ✧ ✧

WE take it to be a gratifying indication of aroused interest and enterprise that coloured collotypes and three-colour block printing are now being undertaken in the British Isles. The Photo-Chromatic Printing Co., Belfast, has the honour of being pioneers in this direction, and a parcel of specimens received from them shews the progress already made. A reproduction (16 × 12½) from an old oil painting, shewing a jovial cavalier, gives a marvellously effective result in the three workings. Others of smaller sizes, figure subjects, shew some capital results; the two Italian subjects lending themselves particularly well to the process. A splendid reproduction "after a stuffed parrot," and a realistically printed violin, disarm adverse criticism. The collotypes, however, fascinate us; the typical softness and dainty effect of collotype, combined with the use of colours, result in most pleasing reproductions. One of the specimens—a seascape (12½ × 7) shewing a breezy day off pier—is a veritable gem, and a landscape (13 × 8¼) is almost as good. We may probably have an opportunity of again referring to the work of this Company in an early issue.



MESSRS. F. KUHN & CO., English agents for the now famous collotype machines made by Schmiers, Werner & Stein, report that the increase of interest in British printed collotypes is causing an increased demand for their machines. They have at present on order from English firms one large size machine, actual printing capacity 27 × 42-in., and several smaller sizes. The direct tin-printing machines made by the same firm maintain their hold of the market, Messrs. Kuhn having five on order.

The Royal Cornwall Exhibition of Photo Process Work.

RANKING as one of the best of the sixty-one exhibitions held under the auspices of the Royal Cornwall Polytechnic Society, the exhibition held at the Society's Hall, Falmouth, from August 28th to September 1st, was of special interest to all engaged in any branch of photo work. Each exhibition of the series, whilst being of a general artistic and industrial character, has taken up some special and distinct feature, and this year, "Photography in the Printing Press," as announced, formed the central and special feature. The efforts of the committee were rewarded with a collection of work which in all probability far surpasses any previous exhibition of this nature.

Probably the most interesting features were the table displays and demonstrations. The Photo-autocopyist Co. demonstrated their process, which is a modification of collotype, and gives very beautiful results in comparatively inexperienced hands. A souvenir was printed from a reproduction of a Pretsch process (swelled gelatine) block, lent by Mr. Thomas Bolas, the editor of *Photographic Work*.

Colour work was the special feature of the photo-mechanical section. The extent of the collection, the variety of processes and exhibitors, and the beauty of the results would be a revelation to anyone, and Falmouth is to be congratulated on being the first place in the world to make such a collection. Perhaps the most important in this department was the small series of five reproductions of oil and water-colour paintings by the three-colour process, by the Photo-Chromatic Printing Co., of Belfast.

More attractive to the general public was the striking display of the Photo-Chrome Zurich Co., the photo-chromes shewing exquisite work.

Bohrer, Gorter & Co. (Graphos), of Munich, had a most versatile display in fourteen large frames, which included much colour work. Judging from the exhibit, few firms can have greater facilities for process work, photogravure, collotype, photo-litho, line and half-tone, on zinc and copper.

The well known phototype printers, S. B. Bolas and Co., obtained the silver medal—the highest award—for their collotype exhibits.

Husnik & Häusler, of Prague (represented by F. C. Clarkson, 4 Fenchurch-street, E.C.), had two large frames, one of ordinary half-tones, the other of colour work by the stopped-out and the three-printing methods. The colouring was rich and brilliant, and in the reproduction of water-colours wonderfully successful.

Ch. Gillot, Paris (represented by Henri Calmels, 17 Furnival-street, E.C.), had an extensive exhibit. It included reproductions of water-colours, etc., but its chief attractions were some wonderfully good facsimiles of coloured crayon sketches and a number of prints from the Spitzer collection, reproducing fabrics, tapestries, etc., in colours and gold.

The printing exhibits of Raithby, Lawrence and Co. included specimens of fine colour work, in from three to eleven printings; and C. H. Fisher (with the Swan Electric Engraving Co.) shewed examples of Swantypes. Hare & Co. shewed their half-tone colour work, in two to six printings; and Sprague & Co. one very fine "ink-photo" reproduction of an architectural subject. Add to all this a great variety of English, Continental and American colour work, both old and recent, in the educational section, and it will be seen that photo-chromatic work was very fully represented.

Photogravure was very well represented by many charming examples from both amateur and professional workers. The principal contributors were The Autotype Co., of Oxford-street, W.; Fredk. Jenkins, Farringdon-street, E.C.; The Art Reproduction Co., South Kensington; Bohrer, Gorter & Co.; Eugene Schaeffenins; and the Farringdon Photogravure Co. An assortment of subjects by American and Continental printers was included in the educational section.

Half-tone on zinc and copper was most fully represented. The Acme Tone Engraving Co., New Bushey, had one large and handsome frame. One of the most perfect half-tones in the exhibition was by Leslie E. Clift & Co., Holborn-place, E.C.: a reproduction of a wash drawing. Carl Hentschel and Co., Fleet-street, shewed about a dozen ordinary proofs from everyday work—blocks delivered within twelve hours of receipt of originals. Good displays were made by Bohrer, Gorter and Co., Husnik & Häusler, Hare & Co., Fredk. Downer (of Watford), and the Art Reproduction Co. The Meisenbach Co., though not exhibiting separately, contributed to the educational section a series shewing the production of a block by the bitumen process, and the prints from fine half-tone blocks that had previously printed 155,000 impressions, and that still give perfect prints.

The Educational and Historical Section, occupying the place of honour and the bulk of the space in the Main Hall, naturally proved a centre of attraction. The historical prints, and others of similar interest, were placed side by side with old woodcuts of 1826, as shewing the earlier illustrative processes. Very complete collections of tools, apparatus, and materials were shewn. The various processes were illustrated by sets of examples shewing the stages from originals to completed proofs, such details as the silvering of copper plates, the coppering of zinc blocks, reproduction of blocks by electrotyping and by hard metal stereo, etc., being illustrated. Many hundreds of interesting examples were included in this section; the whole being personally arranged by Chas. W. Gamble, and H. Snowden Ward, of *The Photogram*.

SPECIMEN OF TOMATO LABEL

PRINTED WITH MESSRS. MANDER BROS.' LITHOGRAPHIC INKS.

WORKS: WOLVERHAMPTON.

A Famous Firm of Printers' Engineers.

THE wide popularity of the machinery and appliances supplied by Messrs. Furnival and Co., Reddish, no less than the magnitude of the firm's dealings with lithographic and letterpress printers, bookbinders, and kindred trades, render the Company of more than usual interest to the trade. The march of progress in many branches of industry may often be accurately gauged by the ingenuity and adaptability displayed in its machinery and general mechanical appliances, and it is not too much to claim that Messrs. Furnival may be accounted as amongst the very foremost in meeting the developments of the rapidly changing art of printing.

In this notice we purpose presenting some details of the *personnel* of the Company, and then briefly describe their work as it appeared on our recent visit. The illustrations have been specially selected with a view to shewing the wide range of appliances made at the Reddish Works.

MR. RICHARD FURNIVAL, the founder of the firm, was born at Halshaw Moor, near Bolton, in 1829. He was apprenticed with a general engineer, and was afterwards engaged as a journeyman. He subsequently became foreman in the extensive works of Sharp, Stewart & Co., who made Wilson's patent guillotine. He left in 1859 to begin business on his own account as a machinist at Ancoats, near Manchester, removing to larger premises in 1866, in Ogden-street, Ardwick, another suburb of Manchester. In 1877, an extensive site of fourteen acres at Reddish, two miles out of Stockport, was acquired, and there has grown one of the largest printers' engineering establishments in the United Kingdom. Mr. Furnival died in 1886.

MR. THOMAS FURNIVAL, the eldest son of the founder of the Reddish Ironworks, was born in Manchester, in 1855. He acquired his engineering knowledge in his father's establishment, where, excepting for a short time spent in the drawing office, he has always been in those parts of the works where the iron itself is manipulated. He has made many improvements in the various specialities of the firm, his latest invention being the hydraulic self-clamp cutting machine, in which the clamp is put on by hydraulic power.

MR. RICHARD B. FURNIVAL was born in August, 1863, in Manchester. He was educated at the Chorlton High School, whence he went to Giessen, a university town in Hesse-Darmstadt. He returned to this country when he was eighteen years of age, and went through the works and the drawing office, afterwards travelling for his firm, and eventually settled in London to represent his house in conjunction with Mr. Powrie.

MR. HERBERT FURNIVAL was born in 1869, and was educated principally at the Chorlton High School. For about two years he was in the shops and the drawing office, since when he has been associated with Mr. Edward Tudor, jun., in the general commercial management of the affairs of the firm.

MR. EDWARD TUDOR, jun., was born in Wolverhampton, in December, 1844. He first entered the service of the late Mr. Furnival as office boy, in 1859, and he has remained with the firm ever since, showing an unbroken period of over thirty-four years. The present position of this well-known firm is largely owing to Mr. Tudor's sterling business qualities and remarkable perseverance. About twenty-five years ago he travelled largely for the house throughout the whole of the United Kingdom; but business grew, and with the consequent enlargement of the work, it became necessary for him to remain at headquarters, where he now, with Mr. Herbert Furnival, manages the commercial part of the extensive business of the firm. When Mr. Furnival died, Mr. Tudor was one of the trustees appointed under his will to carry on the business.

MR. WILLIAM POWRIE was born in Dundee, in October, 1840, and was apprenticed to a millwright. His own inclination was towards engineering, and eventually Mr. Powrie came to Patricroft, near Manchester, and for about three years was employed in the pattern and model department of the celebrated Bridgewater Foundry. He entered the employment of the late Mr. Richard Furnival, in March, 1868, when Mr. Furnival was beginning to introduce the now well-known "Express" guillotine, and Mr. Powrie's first work was to complete the patterns for the 32-in. size; and when Furnival & Co. decided to manufacture lithographic and other printing machines, Mr. Powrie was appointed draughtsman, and had the general supervision of the pattern making, and fitting and erecting. He remained Mr. Furnival's chief assistant in the mechanical department for five years, during which time he visited most of the principal towns in Great Britain and Ireland on business for the firm.

On the opening of a London warehouse in February, 1887, Mr. Powrie was appointed London manager. Mr. Powrie is well known among engineers, having been for two years president of the London Association of Foremen Engineers and Draughtsmen.

Upon entering a works of such magnitude as Messrs. Furnival & Co.'s, the visitor is at once struck with the view before him. At first it seems as though the premises are unlimited, but by degrees the eye becomes accustomed to the network of belts and tools, with the supporting columns, roof irons and cranes, and in the distance can be seen the walls of the great shop. Under

this roof is carried on the making of almost every part of nigh every class of printing machine, and there are also gas engine departments.

To fully appreciate the extensive character of the works it is necessary to take a general view, and finally deal with the most important details. The premises contain every department of manufacture of printing machines, and may be summarised thus :—

The drawing offices.
The pattern shop and storing sheds.
The foundry and dressing departments.
The grinding shop.
General erecting shop.
Smithy
The fitting and finishing departments.

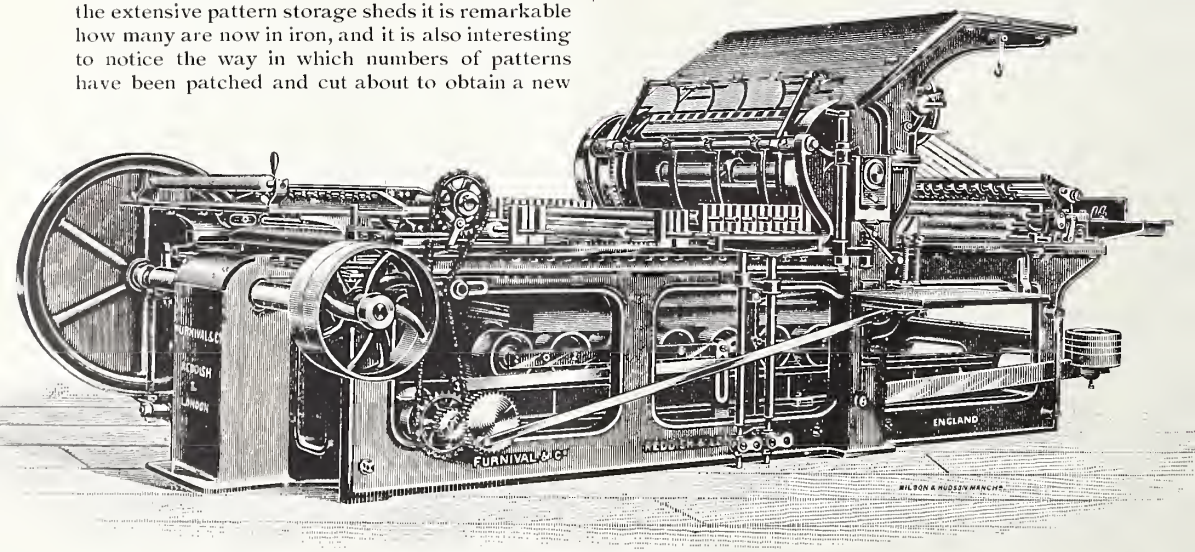
Added to these may fittingly be named :—

The electric plant.
The repairing department.
The gas engine department.

Everyone who has seen or knows anything about mechanical drawings, will know to what a nicèty these drawings are executed. The drawing offices are pleasantly and economically arranged for drawing purposes, and for the storage of the almost innumerable drawings of every size of machine, and every part of such machines, a large fire-proof room being specially built for storing all the "general drawings." Then, again, the pattern shop reveals how each machine is made of wood before it is finally made of iron. The patterns exhibit the utmost care in preparation. Such patterns as have in course of time become standard articles, and upon which improvements are not very likely to take place, are cast in iron and carefully finished off to serve as regular patterns. These are far more numerous than at first sight would appear, and in looking through the extensive pattern storage sheds it is remarkable how many are now in iron, and it is also interesting to notice the way in which numbers of patterns have been patched and cut about to obtain a new design. In these sheds can be seen the actual patterns used for every size of the various machines used in printing establishments.

As may be expected, the foundry is a big black-looking place, but possessing every convenience for casting the largest portions of any machine. It is most interesting to watch the moulders finishing off the moulds to receive the metal, and it is readily seen that the castings produced are of an excellent quality. Such castings are dressed in the adjoining rooms, where rotating cylinders are partially filled with castings and set revolving. This action dresses off most of the large pieces left on in the casting process, and makes them fit to be readily finished by hand or machine. It should be noticed that every part of a machine is made upon the premises, except, perhaps, such specialities as malleable steel parts.

The most interesting part of the premises to an ordinary visitor, as well as to a specialist, is the great shop where the turning, planing, drilling, and fitting are done. There are lathes of all sizes—some very large ones for the cylinders and gas engines. These lathes are fitted with every kind of improvement, and do most effective work. In a description such as this it is impossible even to mention all the arrangements which are here utilised to secure absolute accuracy in the machine making. One point cannot be passed over, and that is the automatic machinery. To a certain extent many lathes and planing machines are almost automatic, but it is the special automatic tools which are deserving of attention. Amongst these are tools for cutting out cog wheels and cogged racks, either in pairs or singly, which leave the machines in a perfectly finished condition. These machines, and others of their class, all tend

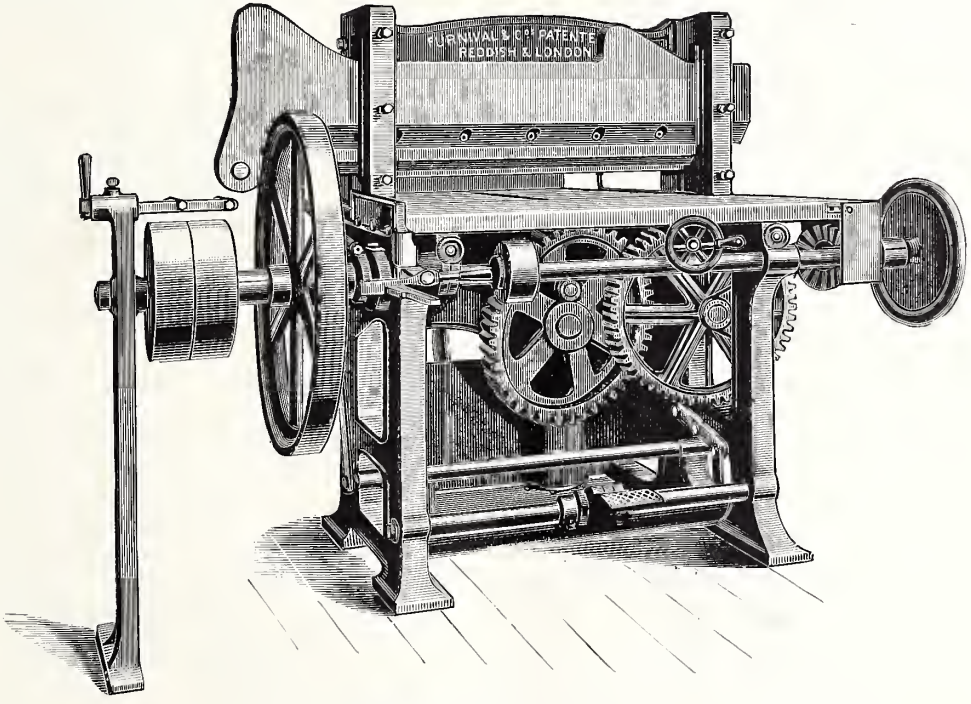


LITHOGRAPHIC MACHINE.

to produce the most accurate work at the lowest rate. Within quite recent times, machines have also been introduced into these works for cutting any shape of cam. The result is obvious; the track followed by the bowl working in the cam is absolutely true all round, and cannot cause a hitch of any kind. Not only is that an advantage, but the result of this machine production is to eliminate "corners" in the cam, and thereby reduce wear and tear. These machines can be fitted with a wide range of templates, and when a breakage does occur in a printing establishment it is satisfactory to know that parts can be supplied to exactly replace the broken portions.

to receive all shafts; when bolted together, the shafts are bound to run true in these borings.

Amongst the many machines of every description, there is one which demands special notice, and that is the immense and costly machinery for finishing the cylinders of printing machines. This machine is perhaps the only one of its kind in the country, and the work done by it can be relied upon as the best produced. The finishing is not ordinary lathe turning, but a system of fine grinding, which brings the surface perfectly true from end to end. To examine the work, a very delicate test is applied. The cylinder being finished is lowered to a perfectly accurate level bar or

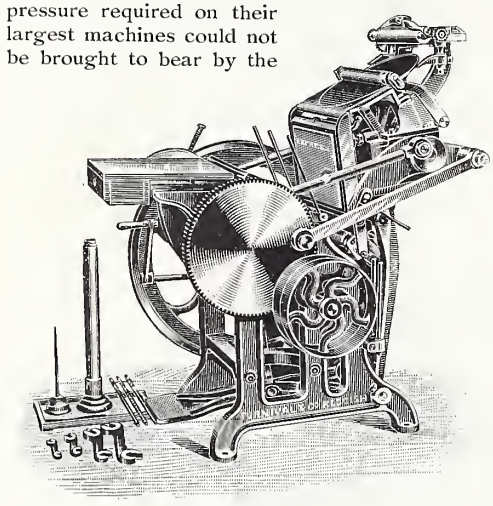


HYDRAULIC SELF-CLAMP GUILLOTINE.

In this same fitting department, the planing machines attract the eye. There are small machines ranging side by side with some of the largest sizes made. It is an odd sight to see one of the largest Wharfedale frameworks bolted together and swung upon a planing machine, there fastened down, and bodily taken through and through whilst the portions for the runners and the tops of the carriage rails are planed dead level. Such a method secures that accuracy which is so necessary, and assists very materially in assuring that the machines must run true and steadily when put upon any floor. Added to this, is the fact that the frames are bored right across

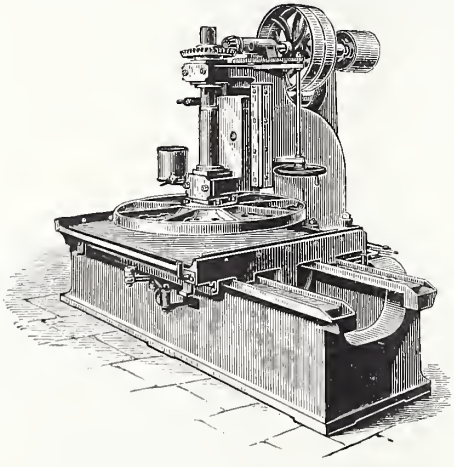
cylinder, and it is rotated in contact with this gauge; a small flame is held on one side, the foreman stands on the other side, and as the flame is moved along the length of the cylinder, if there is the slightest deviation from the dead level, the light can be seen. Should the light be seen at any part, the cylinder is ground down a little more until, by frequent testing, accuracy is obtained. All printers know the value of a true cylinder. It does not necessitate so much covering, or covering of so soft a nature, as a cylinder which is untrue. Cylinders thus prepared should give confidence to the machine-minders, and in the end prove truly economical.

A feature of the machinery turned out by this firm is the persistence in the use of the lever and weights, rather than the springs. It is considered by the firm that the actual pressure required on their largest machines could not be brought to bear by the use of springs. Not only so, but the pressure is certain and determinate. There is never any doubt as to the pressure having been interfered with by any part of the mechanism having become blocked or caught, as may be the case with springs.

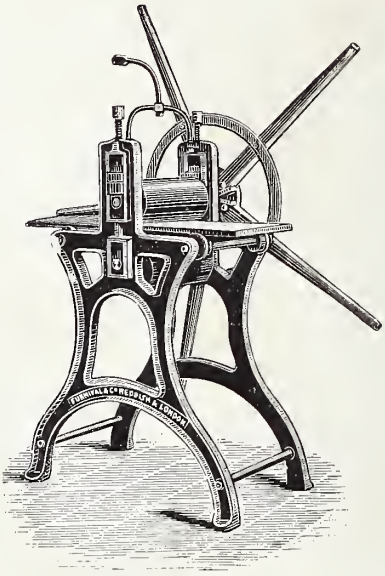


PLATEN MACHINE.

Of the machinery turned out much can be said, but there are only a few of the typical machines which need be referred to. In the lithographic section there can be seen machines in course of construction for work having the dimensions of 64 × 44-in. These are the largest machines yet made, and can be found working in various parts of the country, the majority being in London. The machine now being erected is for a prominent Nottingham firm, which has at the present eighteen quad-crown litho machines, all of Messrs. Furnival's make. In these machines can be seen every appliance for strength, speed, and thoroughness. The machine is extra long, to allow for the full use of eight inkers, 3½-in. diameter, which all clear the stone in working. These inkers are automatically guided, so that in the forward movement, four of them with a new supply of ink roll up the work, and in the backward movement the other four come down with another fresh supply. In this way the work is refreshed from both sides, and secures an evenness of inking hitherto impossible. The strength of these machines is secured by a liberal use of steel. The cylinder wheels are fitted with wrought iron rings around the circumference so carefully planed that they can only just be detected. This ring of wrought iron is cut out into cogs, and with ordinary usage can be guaranteed for any length of time. All the driving pinions and levers are of steel. Naturally a machine so constructed for high speed and great rolling power costs quite half as much again as the ordinary 64 × 44-in., but saves its extra cost in its permanency, great speed, and non-liability to get out of repair. It should be noted also that there are three damping rollers fitted with the American automatic damping arrangement; the machine is guaranteed to run 800 per hour.



STONE GRINDING MACHINE.



COPPER-PLATE PRESS.

It was from machines of this size, made by this firm—being the only firm in this country making these large machines—that the memorable picture of "Bubbles" was printed in London.

The latest development in the making of machines is the collotype printing machine. Messrs. Furnival were the first to make these machines in this country, although perhaps they and others have altered lithographic machines into collotype machines previously. The machines being made now are exclusively collotype, and since they started they have had a steady succession of orders

from different parts of the country. At present there are several of these machines in an advanced state of construction. So far, Messrs. Furnival have not made two collotype machines alike, owing to the different ideas which each printer has on the mode of printing. Seeing that collotype machine printing is really in its infancy, it will be some considerable time—as it was with litho machines—before a definite standard of collotype machine has been established. The two collotype machines now being made are both bound for Scotland, and one was sent to the west of England. Each machine shews an improvement upon the last, such improvements resulting from the different experiences of both the mechanic and printer. Messrs. Furnival hope in the course of a few weeks to have one of these collotype machines on view in their London showrooms. It will be seen that the leather rollers are specially and most carefully made to avoid all appearance of the seam. Specimens of work from these collotype machines were shewn at the Falmouth Exhibition, and the prints in a recent number of this journal, as well as the present number, were also printed from their machines.

Another machine of general use and general interest is the guillotine. Messrs. Furnival make the ordinary self-clamp guillotine, as well as their speciality, the "Express" Hydraulic Self-Clamp, the result of the ingenuity of Mr. T. Furnival. Both of these machines possess almost every desirable feature. The self-clamp can be worked by hand quite easily, requiring only about half as much power as ordinary steam guillotines. The advantage of the machines is that by the use of a treadle the clamp can be brought down at once for adjusting purposes, and just as easily raised until the adjustment is correct. These self-clamp machines obtained gold medals at the Inventions Exhibition in London, 1885, and the Glasgow Exhibition of 1891.

The hydraulic self-clamp is a marvel of easy working. The pressure comes down gradually just in front of the knife, and when the cut is made it just as easily rises again. The motion is so gradual that these machines can be used upon the lightest flooring that printers dare occupy, and it is well known that some printers will occupy premises which many ordinary business men would reject as totally unfit for the proper production of work or the health of their employés. The reputation of these machines, with all their special advantages, place them amongst the foremost in the world. At one time Messrs. Furnival were so assured of the excellency of their ordinary self-clamp as to offer to compete with any firm to prove the accuracy of their assertions in favour of this machine. They are guaranteed to hold any kind of material, are all geared for belt driving, and are made in all sizes. They are fitted, when required, with a patented apparatus for cutting heads and tails, also for cutting paper shavings. There are special features in these machines which make them indispensable to bookbinders.

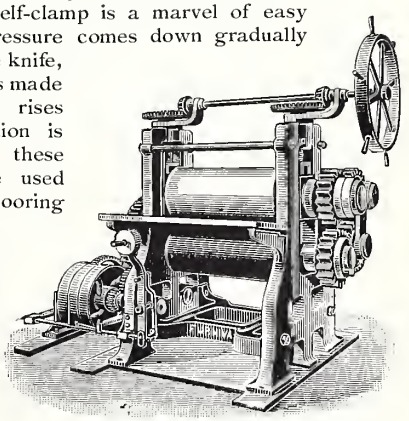
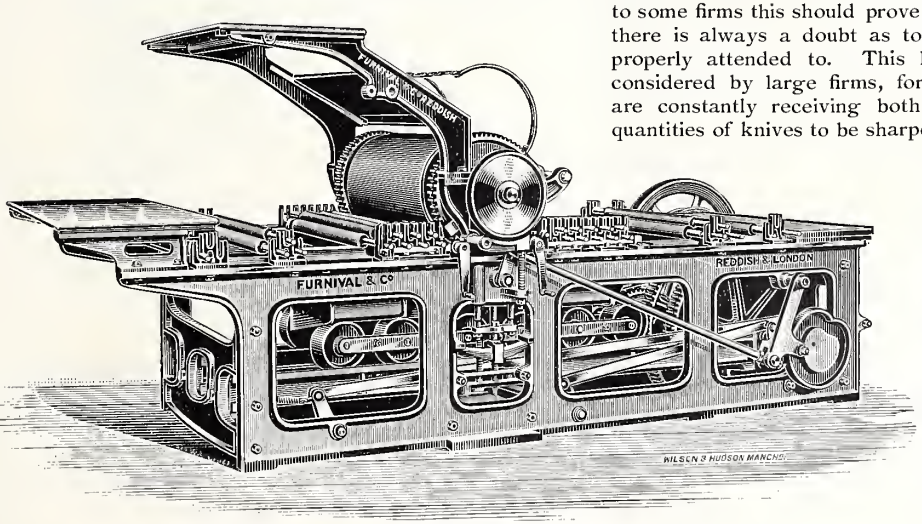


PLATE ROLLING MACHINE.

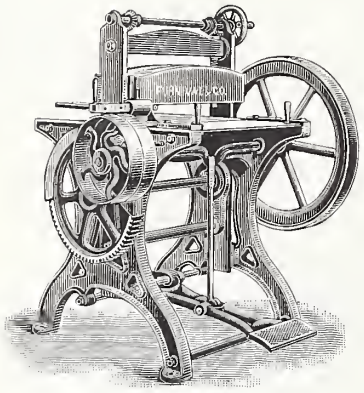
Whilst speaking of the guillotine machines, it should be mentioned that Messrs. Furnival make guillotine knife-grinding machines, and although to some firms this should prove an advantage, yet there is always a doubt as to the knives being properly attended to. This has possibly been considered by large firms, for Messrs. Furnival are constantly receiving both large and small quantities of knives to be sharpened.



COLLOTYPE MACHINE.

Passing on to the letterpress section, there is to be seen a new pattern of Wharfedale machine, in which the roller and flyer arrangement can be entirely raised from the machine upon vertical slides, and leaving all clear for the adjustment of the forme or any other

necessary attentions. On the question of flyers for litho machines, it is asserted that repeat orders for this class of machine are constantly coming in, shewing that it is gradually finding favour in printing establishments.

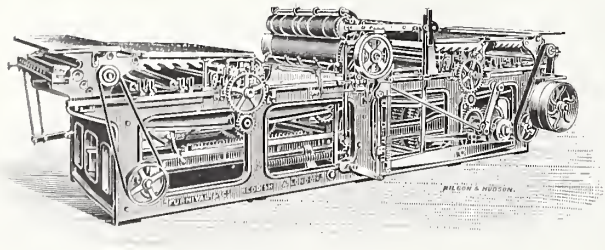


LABEL PUNCHER.

One of the smartest machines now being turned out is the improved platen. This machine has a "variable ink lever," by which the revolution of the duct feed roller can be regulated to increase or decrease the quantity of ink supplied. This lever is in such a position that the printer can move it at any time during printing without stopping or leaving the front of the machine. This machine also contains a method for securing almost the equivalent of double rolling. After the inkers have passed over the forme in the act of first inking, they then pass down still lower and come in contact with a sharply-curved plate, the duplex distributing plate having a side motion combined with the revolutionary or rotary motion. The rollers are thereby smeared over again with the ink left on them, covering the parts with ink which have deposited the first supply upon the type; in returning over the forme, the rollers are again able to ink the type before passing on to the slab for a fresh supply of ink.

In platens Messrs. Furnival are now making a special pattern, said to combine all the qualities of the Golding Jobber. It is a wonderfully easy working machine, giving results by foot power alone, which have hitherto required steam driving.

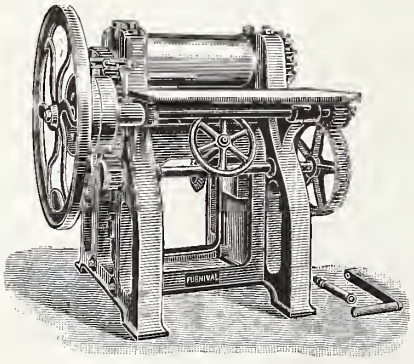
The gas engine department, although apparently not a printing machine department, nevertheless belongs to the printers' engineers' specialities, for so many printing establishments are now driven by gas engines. The engines are of an excellent type, running with the utmost smoothness, and although not primarily gas engine makers, this firm, with its extensive facilities for obtaining expert mechanics, and with its large and special tools, can claim to turn out gas engines equal to anything in the market. They make gas engines from one-half horse-power upwards, and at the present time they are making one which wil develop probably as high as fifty horse-power.



TWO-COLOUR WHARFEDALE.

In the bookbinding machinery department there is a special machine which scores and cuts thick boards at one operation.

In concluding this brief review of the machines manufactured, it will not be out of place to enumerate the machines which are actually made upon the premises, viz.:—Lithographic machines, lithographic presses, lithographic stone-grinding machines, "Express" ordinary guillotines, "Express" self-clamp guillotines, "Express" self-clamp hydraulic guillotines, guillotine knife-grinding machines, copperplate presses, "Wharfedale" letterpress machines, improved "Express" treadle



BOOK ROLLING MACHINE.

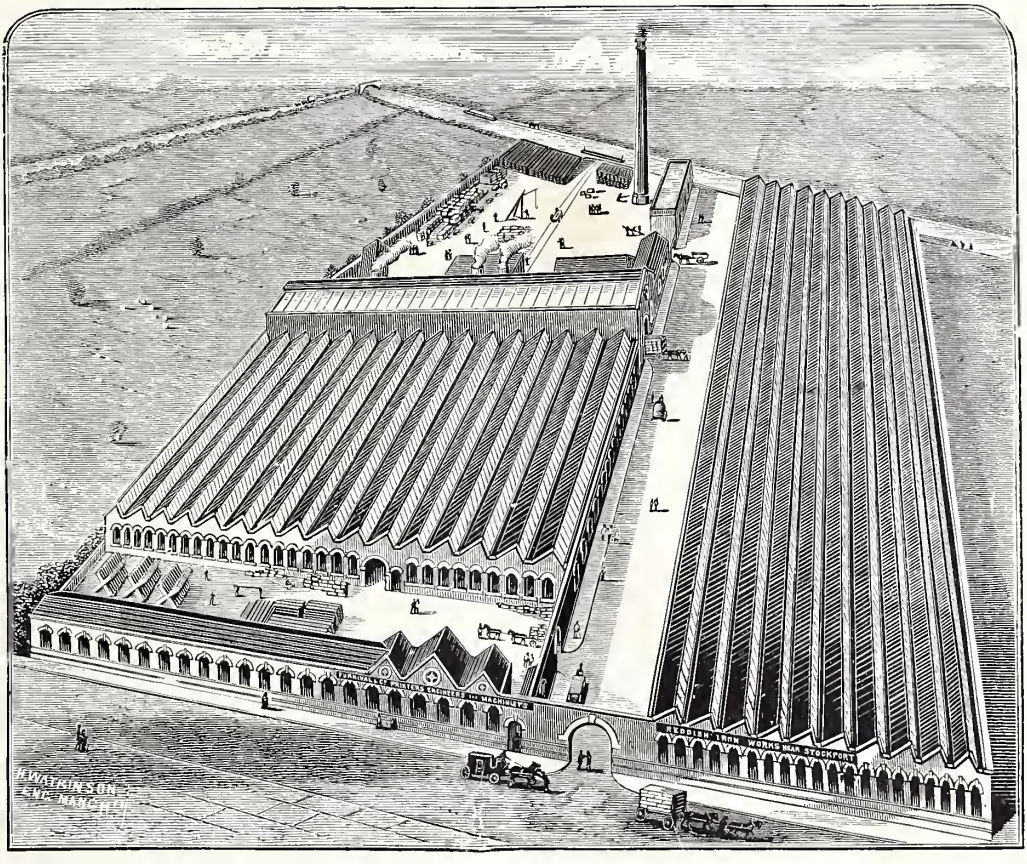
platen machines, improved "Express" platen machines ("Golding" model), colour mills, paging or numbering machines, perforating machines, patent "Universal" job and label cutting machines, label punching machines, millboard cutting machines, card cutting machines, box making machines, standing presses, nipping presses, Gill's hot-rolling machines, cutting and scoring machines, scoring machines, envelope and label punching machines, plate rolling machines, bookbinders' rolling machines, two-colour "Wharfedale" machines, collotype machines, gas engines. So far as possible, illustrations of these machines are included in the present review.

Taking the works in general, much can be said in praise of the arrangements. The whole works are on one level—on the earth, so that vibration and noise are reduced to a minimum. The lighting by day is through the glass sides of a series of shed roofs, just as in a weaving mill, and as various large lithographic firms have rebuilt their printing rooms. At night the lighting is by electric light, supplied from an adequate plant in the

vicinity of the general grinding room, where the great grindstones are revolving, reminding one of the fearful consequences which might ensue should one of them burst.

Just outside this corner of the building is the engine house, with its powerful engine of 400-H.P., driving machinery throughout the works by an excellent specimen of belting. Some few years ago this engine drove by ropes, but the ropes have been abandoned, and belting resorted to.

acres reserved for extensions out of the original 13 or 14 acres purchased by the founder of the firm—the late Mr. Richard Furnival—prior to his removal from Ogden-street, Ardwick, Manchester. The works are situated at Reddish, very near to Stockport and Hyde, and not much further from Manchester. The railway facilities are very fair, and the district is quite open and healthy. The village is but small, yet contains other extensive factories, and is devoted entirely to "work," like



The pattern sheds are ranged in a row still further away from the main building, in an isolated position, and the canal runs along the back of the works.

The great shop is divided by a broad gangway, which accommodates lorries, etc., and forms the great passage for all purposes. Along the roofing girders are arranged various cranes—the hand crane, the rope gearing crane—all of which are arranged to travel the full length of the bay from one side of the shop to the other.

The works in all cover about five acres of ground, whilst the artizans' dwellings, mostly the property of the firm, cover another five acres, leaving three

many other of the great industrial centres in Lancashire and Cheshire.

At the present time these works are as busy as they can be; every available inch of space is occupied, some parts working overtime; whilst the employés are twelve per cent. more numerous than they were last year. We feel that such a visit affords an opportunity for a practical form of education which should be enjoyed by everyone in the trade, and one cannot fail to feel some regret that he cannot adequately convey by writing or illustrations the real extent of the business or the value of such a visit.

By CHARLES HARRAP.

CHAPTER XVI.—*continued.*

TRANSFERRING.

THE transfer paper used by the generality of litho writers is prepared with a composition of some hard gelatine, and it will be necessary to let it remain for a longer time in the damp book than most other papers. In fact, this class of papers is the least likely to go wrong by over-damping. It must not be taken as a rule that thin papers are all alike in this respect. There are the very thin papers used for colour work, which are frequently made by a mere film of starch on a varnished paper, or upon a bank post, and which require very little damping in the book. These thin papers are better made with a simple composition of starch, rather than of some gelatine, so that they can always be put down upon a cold wet stone. If they be damped, it must be only momentarily, and then put down upon a damped stone, to ensure that there is sufficient moisture between the surfaces to give the adherence and prevent the paper from rising in blisters, to eventually cause the work to be doubled in those parts.

Copper-plate transfers are usually pulled upon a thick composition, which contains a large quantity of matter which is readily soluble upon the application of water. This necessitates that such transfers should only be damped to a small extent, to secure their perfect adhesion; after which more moisture can be safely added from the back to release the composition from the paper. In the operation of transferring, it is customary to damp the back of the transfer paper until the paper will peel off without bringing away any of the composition. This course is certainly the best where the transfer will stand the amount of moisture which is thus put upon it. But when there is any chance of the extra moisture dissolving the work, then it should be carefully watched that the amount of water put upon the back is brought down to the least possible quantity necessary to secure the proper adhesion of the transfer all through the operation. This is a most important point, for should the transfer become at all dry at any part, it is possible that at that point it will leave the stone and ultimately cause doubling or a bad patch in the transfer.

The partial drying of the transfer is not always the cause of doubling. There are times when by faulty handling in the operation of laying the transfer down upon the stone it is allowed to touch the stone before it ought, and in such places the transfer frequently catches upon the stone, giving a doubled patch in the finished state. It is very difficult to obviate this mishap when the transfers are large and unwieldy. There are methods of manipulation which reduce the possibility of this error. The best plan seems to be to have the transfer supported by sheets of paper, until such time as the transfer is quite ready, then carefully withdraw the sheets and leave the transfer flat upon the stone. A large transfer may be manipulated by two men in such a way that it is lowered on the face of the stone by being held at both ends, and gradually letting the centre touch first, or by putting down one end, and allowing the sheet to slowly fall upon the stone from that end, being held firmly down.

A matter which appertains to the use of the damping book is the necessity of keeping the work in register. If the work is to be damped, then precautions must be taken to prevent as far as possible the stretching of the transfer paper. This is done in a number of ways which more or less meet the purpose.

First of all a series of transfers should be drawn in the same direction as the make of the paper, and in transferring they should be mounted so that in the press they are all run through in the same direction.

Secondly, if the series of transfers consists of the colour stones of any drawing, and are prepared upon rather thin paper, then they should be mounted upon a thick board. The mounting should be of a firm nature, and not at all liable to give way upon the addition of the moisture. This mode of treatment applies most particularly to a series of grained-paper transfers. The thick board may be replaced by a sheet of zinc, which in practice is found of considerable value. But it is always the most certain to put all work down upon cold stone when absolute accuracy is required. Plans, mechanical drawings, and colour stone transfers should be, without exception, transferred to cold stone.

In making up a sheet of transfers for warm-stone transferring, they should be patched up with flour paste. For cold stone, they should be patched with glue, or gum may be used; the latter is soluble in cold water, and therefore it is liable to re-dissolve with the cold water, and should not be used more than is necessary.

Thirdly, it is also found that to obviate the stretching of the transfer, a simple method may frequently be employed: this is to keep the back

THE FIRST "VALKYRIE."

Reproduced by the ROTHESAY COLLOTYPE Co. from a Negative by J. ADAMSON & SON.

of the transfer dry whilst in the damping book, by placing upon it a sheet of zinc.

It is almost needless to say that with the utmost precautions, transfers which have been damped will stretch to a certain extent; even transfers which have been put down to cold stone will shew some signs of the same fault. In practice it is necessary to adopt some means to reduce this apparent error to a minimum. Thus all mechanical work should be drawn with the scale upon it, so that in transferring, the scale stretches to the same extent as the other parts, and the print may be measured by the scale which is printed upon it. If the scale is indicated by some such expression as "one inch to a foot," then it is very probable that any measurements taken from it will vary from the exact truth by a very slight amount, and will be considered wrong.

After a transfer has been damped it should be run down without delay, and when run through a time or two, there should be extra damping done by sponging the back of it. In this way a transfer may be soaked right through, and the paper taken off without any difficulty. The running through will press the moisture into the paper, and ultimately release the composition from the paper without the use of any hot water or any other means of hastening the result. But as speed is so necessary in the business, the most expeditious way is to put on the back of the transfer some hot water, and get the paper off so that the work may be gone on with. No harm can arise from such a course, although it may appear risky to put hot water upon any greasy compound.

It should be remembered that it is necessary to renew the moisture of the transfer when in the press, because the original moisture is liable to dry out and leave the transfer without sufficient to keep up its adhesive properties.

After the transfer has been properly damped, it has to be placed upon the stone and run through the press. The pressure applied at first must be a good grip, and subsequently screwed down a little more as the running through is continued. In the last few runs through, the pressure should be almost as heavy as can with safety be applied.

The paper is next removed. If the transfer has been run through a considerable number of times and water has been somewhat largely used on the back of it, then the paper should peel off without the least difficulty. If this is not at once apparent, then swim the back of the transfer with water and place a sheet of paper on to prevent rapid evaporation and to keep the layer of moisture quite even. For the same purpose the damping cloth may be spread over the transfer when damped. In a little while the paper will peel off readily. The use of warm water is more effectual than cold.

In the use of varnished transfer paper, no set rule can be applied. The most expeditious method is to damp both the stone and the transfers, after which it may be possible to peel the paper off readily. It is no use damping the back of a varnished paper during transferring, for the water is not likely to get through evenly, if at all. It is a matter of patience when using this paper, and occasionally the transferrer is rewarded with a set of such transfers which peel off at once; at others, on the contrary, he has to scrub the paper off, taking especial care not to destroy the work.

There are times when these transfers upon varnished paper may be put down dry, in which case they leave the stone far more readily. This plan may be adopted successfully for putting down a series of transfers upon a grained or polished stone, so that the stone may be left dry and ready to work upon.

After any of such treatments, the paper having been removed from the transfer, the composition should be allowed to dry, the stone gummed up, and allowed to stand for ten minutes if a cold stone, if a warm stone allow it to stand till cool. These directions are very seldom followed. Most frequently, cold stone transfers are damped off and proceeded with at once; whilst warm stones are put into water to cool rapidly, and are proceeded with as soon as possible.

Experience has proved that in the majority of cases such expeditious treatment has not been detrimental to the work. In every case, however, the transferrer must use a fair amount of common-sense, only submitting such strong work to the rougher usage as he knows will stand it. The finer work, and chalk work, must all be more carefully dealt with, as already directed.

In drawing the remarks upon transferring to a close, it will not be out of place to sum up briefly the chief points in the process as follows :—

Set the stone. Try the pressure all over it carefully at first. Level it with feather-edged pieces of paper. Level the scraper upon glass paper laid upon the stone. Lay the transfers, and run them through under a medium pressure. The backing should consist of clean paper and a fine blanket. The fine blanket is more necessary when a zinc tympan is used. It is, however, advisable to always use a fine blanket as part of the backing. This blanket may be mounted upon a card. After running through a time or two, remove the backing and apply water sparingly with the sponge. Replace the backing and again run through. These two processes may be repeated until the paper peels off. When the act of transferring is to add new work to a stone with work already on, the greatest care must be exercised in using clean backing to face the stone every time it is removed. If the stone has had to be levelled, it is better not to turn it round during the process, and finish up the transferring by pulling it through a few more times, but to take the scraper out and reverse it in the box. Any little defect should thereby be overcome and good transfers secured.

The running through is succeeded by the damping off of the transfer paper already fully dealt with, and is followed by the rubbing or rolling up of the work.

It should be noticed that the work newly transferred is in a condition to be easily spoiled, and the method of bringing it up must vary according to the nature of such work. The transfer may be in any of the following inks:—

Stone to stone or ordinary printers' transfer ink.
Copperplate transfer ink.
Letterpress transfer ink.
Photo-litho transfer ink.
Writers' or artists' transfer ink.
Copal or any other grade of chalks.

Or it may be in a combination of several of them.

The first four in the category may be considered as much the same in general greasy properties and treatment, but they are distinctly weaker than the two last inks in the list. When a transfer is put down in the two latter, all other conditions being good, there is very little chance of it being readily erased. There is, however, considerable chance of such work being destroyed by mechanical abrasion or incorrect treatment.

A treatment which will, however, meet all cases is to gum the work up well and allow it to dry. Then wash the gum off, and still retaining some gum on the stone, gently rub the work up, using a soft rag or sponge charged with ink let down with a little turpentine. Such a course can only be recommended for ink transfers. Chalk transfers should not be so treated. Again, if the transfer consists of large patches of thick ink, then before attempting to rub the work up, a slight etch with very weak nitric acid in gum will assist in removing or changing the surplus body of readily soluble ink into a less soluble compound, and making it far easier to work. A similar treatment must be given to chalk transfers.

[*To be continued.*]

Aluminium Plates.

THE following, from the *American Bookmaker,* sums up progress in the direction of the introduction of aluminium plates for lithographic printing:—

A new use has been discovered for aluminium, which promises important results, if not a revolution in lithographic printing. It has been found that the great porosity by which aluminium is distinguished among metals, as well as its peculiar granular structure, renders it es ccially adapted to every kind of work in which the lithographic stone is employed. As a substitute for the cumbrous and unwieldy blocks it possesses advantages which give it a decided superiority over the stone, and which will lead eventually to its adoption by the trade.

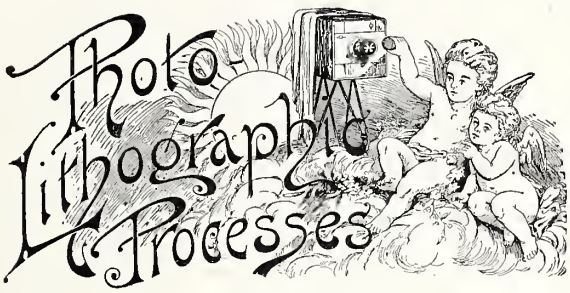
In anticipation of the exhaustion of the Bavarian quarries, efforts have been made to utilise zinc as a substitute for the costly and ponderous blocks. One of the largest lithographic firms in the city of New York testified that it spent $75,000 and ten years in futile attempts to supersede the stone by carefully grained and chemically prepared plates of the metal. It was ascertained, however, that it was unfit for the finer kind of work, while for the inferior description it is not always reliable. It is only with the most careful manipulation that it can be employed in any sort of surface printing.

In the use of aluminium no such difficulty is encountered, as the metal is adapted to the finest kind of work. Prepared plates have been tested by the American Bank Note Company with such marked success as to leave no doubt of its applicability to the reproduction of the highest quality of steel engraving. It has been found also by conclusive tests to be no less adapted to crayon, colour, half-tone, map work, original drawings and reproduction of prints; and as the texture of the plate can be condensed to the highest degree by successive rolling, the grain can be made much finer than that of the best quality of stone. This is shewn especially in the character of the solid work, which is in striking contrast with the greyish impression made by the stone. While it likewise differs in granular structure from that of the stone, which is capable of change or improvement, its superiority in lightness, as well as in cheapness, is decidedly in its favour.

In the matter of weight alone the difference between a lithographic stone with a superficial area of 30×40 inches and an aluminium plate is less than 1 to 100, the latter weighing about four pounds, and the former about five hundred pounds. The difference in cost is not so marked, but it is sufficiently in favour of the metal plate, being in the proportion of over 1 to 2. As the question of weight is serious, the value of the aluminium plate will be at once appreciated by the trade, in view of the great saving effected in space and storage, one ton of aluminium in the form of printing plates occupying only the space of one hundred tons of stone.

In the process of printing there is little difference between the two materials; but as sheets of aluminium are very flexible they can be used on curved or rotary as well as on flat surfaces, giving them decided superiority in the greater rapidity thereby effected, the speed of printing being almost doubled.

To cement brass, or any other metal, upon glass, take one part of caustic soda, three parts of resin, forty-three parts of water, and rub up well with plaster of Paris, equal in weight to half that of the above mixture.



COLLOTYPE.

CHAPTER XVIII.—*continued.*

9. REVERSING BY THE USE OF A TRANSPARENCY.

In the first place the "negative" which is used in the "powder process" is a transparency, and by that process a reversed negative can be readily produced. But there are so few manipulators who go in for using the powder process in England, as compared with the large number who use it on the Continent, that the other mode of using a transparency is most commonly employed.

The transparency is produced by placing a good dry plate behind a negative in a printing frame, and afterwards developing with ferrous oxalate or ferrous citrate, or both, in the developer. The gelatino-chloride plates have for some years been specially prepared to give first-class transparencies.

Having obtained, developed, and fixed the transparency, it must be turned round and used in a camera so that light passes through its clear portions and makes a negative upon another sensitive plate, in the opposite direction to the original negative. This last negative is a reversed negative, made through a transparency.

10. REVERSING BY THE USE OF A TRANSPARENCY FROM CARBON PROCESS.

Much after the manner of the powder process a sensitised gelatine can be prepared containing a quantity of fine powder. This pigmented sensitised gelatine may be spread upon glass, and finally printed in the frame by contact. After printing, it can be well washed and thereby forms a positive transparency, from which a negative can be prepared as in section 9.

11. REVERSING BY "TRANSPOSITION" IN THE PRINTING FRAME.

It is well known now that any sensitive photographic plate, if left too long under exposure, suffers transposition. That is, the first effects of exposure are eradicated and those portions previously unexposed become affected entirely as though they had been the exposed portions. It is impossible to draw up any accurate formulæ for this process, as it depends upon :—

(a) The character of the plates used.
(b) The varying quality of daylight.
(c) The variations in negatives.
(d) The developer used.

To obtain this transposition—and consequent reversal—the negative to be reversed is placed in contact with a sensitised plate, and exposed in a printing frame. Mr. W. Bishop, in describing his experiences in this direction, says that he has used the Ilford dry plates, and that in morning light, with a northern sky, the exposure necessary varies from five to ten seconds, and up to thirty seconds towards sunset, according to the density of the negative. It is often useful, when the negatives have great density, to give the sensitive plate a momentary exposure to daylight, thus assisting the actinic effect which has eventually to be set up through the densest portions of the negative. It is in the exposure that much judgment is necessary, but not more so than in making bromide prints or lantern slides. In developing, this operator has found any developer of ordinary quality almost as good as another, giving a preference to the new metol-Hauff developer. Of course in development if the image comes up quickly, the transposition is not complete; if it comes up slowly, then the transposition is overdone. The next attempt can be regulated accordingly.

This process is an exceedingly rapid one for reversing, and in the hands of a good operator gives clear and crisp (reversed) negatives equal—and sometimes superior—to the original.

CHAPTER XIX.

PROVING AND PRINTING COLLOTYPE PLATES.

THE collotype plate, prepared, exposed, and developed, as described up to the end of chapter XIV., should be soaked in cold water for about half an hour before it is "etched." This soaking is followed with a general cleaning of the glass plate at its edges and back. Then it is "etched." The etching solution may be :—

Glycerine	1 part.
Water	2 ,,

Or, another recipe :—

Water	12 ozs.
Glycerine	1 pint.
Common salt	30 grns.

in which the plate may be left two hours before proceeding.

Or, another recipe :—

Water	10 ozs.
Glycerine	5 ,,
Oxgall	10 drops.

in which the plate may etch for half an hour.

Or, another recipe :—

Water	100 parts.
Glycerine	100 ,,
Common salt, or Hyposulphite of soda	3 ,,

necessitating one and a half to two hours' soaking before commencing the printing.

After the plate is thus prepared for printing, perhaps there is no part of the process which requires less description than the printing. It is almost the same in every particular as lithographic printing, and any lithographic printer can master it with the exercise of a little patience and skill.

The collotype plate is taken from the etcher and put upon the press, where the etcher should be removed with a sponge. The first etching should be sufficient to keep the film damp for a considerable time. If not, a repetition of etching by means of a sponge saturated in it, and wiped over the film after each of the first few impressions, will gradually give the desired result.

The picture is then rolled up by means of a fine nap roller fully charged with fine black ink, thinned with varnish. Professor Burton points out that Mr. K. Ogawa has prepared an excellent collotype ink, by mixing Japanese lampblack with lard. It is generally understood that the present commercial collotype ink is really fine printing ink, worked up with lard instead of varnish. Any coloured ink may be used, so long as it is reduced to a very fine state of division. The picture is rolled up with the heavily charged leather roller, this rolling up being executed slowly and with a heavy pressure. Then the composition roller, lightly charged with a thinner ink, is rolled carefully over the picture. This roller removes a quantity of the heavy charge of ink, and at the same time inks up the lighter shades which were missed by the leather roller. In this way the whole picture is evenly and fully inked.

Upon the collotype plate is placed the mask—the aperture of which should be about one-sixteenth of an inch larger than the finished print is required to be. Upon the mask the paper for the print is placed. The paper is registered to certain marks drawn upon the back of the mask, whilst the mask frame is so arranged that it always falls around the plate in the same position. The tympan is brought down and the press run through. It is better at the commencement to have only a little pressure on, and to increase it for the second and third impressions, until the proper strength of print is obtained. It must be remembered that the collotype film is upon glass, and that it is very risky to put the pressure on all at once, without gradually working up to the necessary pitch.

After the impression is taken off, and the mask raised, the plate may be damped (or etched) with the etcher in a sponge; or if the etching has become satisfactory, then the plate will only require an ordinary damping by the use of the damping rollers. It should be noted that if the etching has been well attended to, the film will not even require damping with the damping roller after each impression, but only after a few prints have been taken.

In the above case it is assumed that there are two inking rollers used. Although by far the best effects are obtained by using two rollers, especially if the first roller is charged with a full-bodied ink, and the second with a tint, yet a very respectable print can be obtained with the use of only one roller. To perform this, the ink is prepared on the slab with lard, and is sparingly charged upon the roller; this in turn is well worked up on the inking slab, until there is but a thin layer of ink upon it. With this the collotype film must be well rolled up. The roller will require charging over and over again until the picture is rolled up heavily with the ink, and the lighter shades begin to look too full. Then, as in lithography, the almost bare roller is rolled rapidly and lightly over the picture, until it clears away all the surplus ink. In due course the picture assumes the requisite conditions, and is printed from as above.

The paper used for collotype impressions must be one which will take every particle of the picture, and not too hard to go down upon the film and into its depressions. Hard enamelled papers or hard-faced papers are entirely out of place. The paper must be of a very fine texture, full bodied, and quite clear, and it assists in getting full impressions if it be slightly damped. Papers which fall into this category are the art printing papers and plate paper.

Whenever the film has been damped, it must be wiped or dabbed off dry with a soft damp rag. It is better before using the second or glue roller, to treat its surface only, by rolling it in a very shallow dish in a thin layer of a one per cent. solution of tannin in methylated spirit or alcohol. Inks of any shade can be compounded by any good printer, although almost any colour or tint can be purchased ready mixed.

In collotype printing it is something the same as the present experiments in printing photographic reproductions of coloured subjects in three printings—a lot of time and energy is spent in getting a few good impressions. The first few impressions are always poor, and it is only after a considerable experience that any collotype printer can succeed in starting to pull good impressions at once. It not unfrequently happens that a collotype film will break up before one hundred impressions have been taken. They may give a thousand copies or more, but that is not often the case, unless the films have been prepared most carefully and allowed plenty of time to dry before exposing and before printing. If the weather should be cool, it will assist in getting some few thousands of copies from the film. Many prints can be vastly improved by careful attention to the pressure and the scraper.

The slabs used for inking upon may be lithographic stones or sheets of metal.

The finished prints are frequently varnished. Such varnishes may be prepared by dissolving and mixing:—

Gum mastic	1 part.
Shellac	2 parts.
Alcohol	q.s. to dissolve.

Or a water varnish may be prepared by mixing shellac in a hot solution (not boiling) of borax.

Seeing how many are the difficulties and possibilities of failure in collotype, it will be well to conclude this special section with a few remarks upon the matter. Many of the points have already been referred to, so in some cases it will require only the briefest references.

Air bubbles must be excluded from all solutions or films. The glass or metal plates must be scrupulously clean. The solution for coating the plates should be kept up to the necessary heat to retain the liquid condition of the constituents, and it is better to always test the temperature with a thermometer. Evenness of the films upon the plate. Uneven films give uneven impressions. This unevenness may result from inclining the plate at the time when it is being carried. All solutions must be filtered. The drying box must be kept scrupulously clean. Thick films must be dried slowly. If dried quickly they frequently result in giving a very coarse grain to the print, if used; or it may cause the film to break away from the glass. Thin films dried at a high temperature become sensitive all over, and take ink all over. This must not be confounded with the generally dirty impressions which result from a want of damping the film frequently. Spots are due to an unsuitable gelatine as well as other causes.

When the print is very black, it may be due to the pressure being too great, the ink too thin, or the film over exposed. If it is the exposure which is at fault, then treat the film with a five per cent. mixture of ammonia.

When the print is too light, it may arise from want of pressure, from the ink being too thick and not rolled in heavily enough, or from under exposure. Certain gelatines will give the same effect, as also drying at too low a temperature, or having too thin a coating upon the plate. The print may be improved by using a full coloured ink, let down with a little olive oil, or olive oil and lard.

The plates may break from the most trivial causes, such as a grain of sand or emery left on the plate, or from small clots of gelatine adhering to the under-surface of the glass, or from unevenness on the bed of the press. The collotype plate should be placed upon a few sheets of blotting paper, or a thin felt, to allow for inequalities in the plate.

[To be continued.]

SCANDINAVIA promises to carry all before her; she has invaded the drama, literature, and fine arts, and now one of her sons—Steinlein—promises to remain the "first letter in the first line," as an illustrator of coloured posters. Chevret & "Misti" must look to their laurels.

Our Collotype Supplement and Messrs. J. Adamson & Son.

THE firm of Messrs. J. ADAMSON & SON, Rothesay, N.B., have long enjoyed an enviable reputation as high-class photographers, and their yachting views have become known far and wide.

This business dates back some forty years ago, when Mr. Adamson, sen., first commenced photography as a business in Glasgow. Last year the senior partner retired from the firm, which is now carried on by Mr. Adamson, jun. under the old name, and under his able and energetic management the business has assumed extensive dimensions.

The studio and accessory rooms are replete with every necessity for best work and the comfort of sitters. For some time past the photographing of marine subjects has been made a speciality, and more particularly yachts and shipping, so common on the western coast, have been studied with advantage. A glance down their list of marine studies, etc., gives some idea of what has been done in the last five years. The subjects are varied, and include work of the greatest interest to travellers and ordinary tourists.

To further spread abroad their splendid work, collotype reproductions have been produced for the firm for some time past, but the process did not always commend itself to Messrs. Adamson, at least as exhibited in trade work. Perhaps the reason is found in a remark of Mr. J. Adamson, who says that in marine work, such as yachts, steamers, ships, it is impossible to get good work unless there is a complete knowledge of boats, the firm have therefore laid down very complete machinery for collotype work on their own premises. Messrs. Adamson have also laid down Hume's Cantilever plant for making, enlarging or reducing negatives by limelight. The condenser used for this purpose is sixteen inches. This makes the firm independent of daylight during the dull winter months.

A fine collotype plate of the victorious *Britannia* winning the Queen's cup has reached us from the Rothesay studio, and in general effect, in soft and shaded tones, and in attention to desirable details, the picture is a real work of art, well meriting the encomiums it has received.

The Rothesay Collotype Co., as the new business is styled, has commenced in good style, and there is every indication of a highly prosperous career before it. Its aim is to turn out a class of work in advance of what has yet been done, no cheap work is undertaken, and customers may be assured of obtaining really satisfactory work. The collotype supplement presented with this issue shews the class of production of which the firm makes a speciality. It is pretty evident that the Clyde men intend coming in first for yet another art.

What is Colour?

CHAPTER XII.

(Continued).

HARMONY OF COLOURS.

Assortment of Colours with Grey.

Binary Combinations:—

	1		2 (quiet and agreeable)	
128	Blue	Grey	129 Violet	Grey

This harmony of analogy is agreeable and useful, but less so than with black.

130	Orange	Grey	131	Yellow	Grey	132	Bright green	Grey

These are equally agreeable harmonies of contrast. Yellow and grey are better when the grey is dark. The arrangements with black are slightly better. Orange and grey better than orange and white.

133	Rose	Grey

This is dull, and inferior to rose and black. These binary arrangements are all inferior to the binary arrangements with white.

Tertiary Combinations of Complementary Colours and Grey.

Red and Green.

	1 (fair)		2 (moderate)		3 (poor)			
134	Grey		135 Grey		136 Grey			
	Red	Green	Red	Green	Red	Grey		
			Grey	Green	Grey	Green		

This is a doubtful harmony. The arrangement No. 3 looks better with black.

Blue and Orange.

	1 (best)		2 (better)		3 (moderate)			
137	Grey		138 Grey		139 Grey			
	Blue	Orange	Blue	Orange	Blue	Grey		
			Grey	Orange	Grey	Orange		

Yellow and Violet.

	1 (best)		2 (better)		3 (fair)			
140	Grey		141 Grey		142 Grey			
	Yellow	Violet	Yellow	Violet	Yellow	Grey		
			Grey	Violet	Grey	Violet		

These combinations are not by any means so brilliant as when arranged with black.

Tertiary Assortment of Non-Complementary Colours and Grey.

Red and Orange.

	1 (best)		2 (better)		3 (good)			
143	Grey		144 Grey		145 Grey			
	Red	Grey	Red	Orange	Red	Orange		
	Grey	Orange	Orange					

These arrangements with grey are better than with white; but inferior to the brilliant effects with black.

Red and Yellow.

	1 (better)		2 (fair)		3 (moderate)			
146	Grey		147 Grey		148 Grey			
	Red	Yellow	Red	Yellow	Red	Grey		
			Grey	Yellow	Grey	Yellow		

The effect with grey is not by any means so good as with black.

Red and Blue.

	1 (better)		2 (moderate)		3 (moderate)			
149	Grey		150 Grey		151 Grey			
	Red	Blue	Red	Blue	Red	Grey		
			Grey	Blue	Grey	Blue		

The effect with grey is not equal to the effect with white.

Red and Violet.

	1 (best)		2 (better)		3 (good)			
152	Grey		153 Grey		154 Grey			
	Red	Grey	Red	Violet	Red	Violet		
	Grey	Violet	Violet					

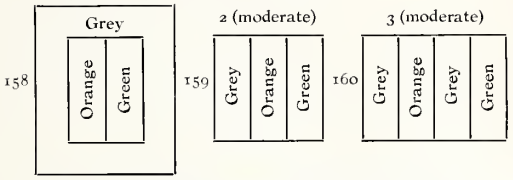
The effect with grey is about equal to the effect with black, and superior to the effect with white.

Orange and Yellow.

	1 (best)		2 (better)		3 (fair)			
155	Grey		156 Grey		157 Grey			
	Orange	Grey	Orange	Yellow	Orange	Yellow		
	Grey	Yellow	Yellow					

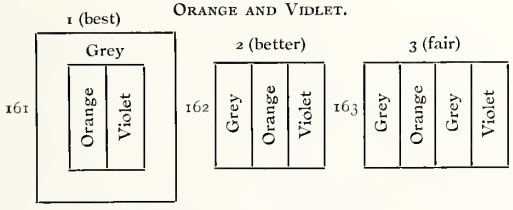
This harmony of contrast is less intense than with black. The arrangement No. 1 is slightly superior to the similar arrangement with white.

ORANGE AND GREEN.



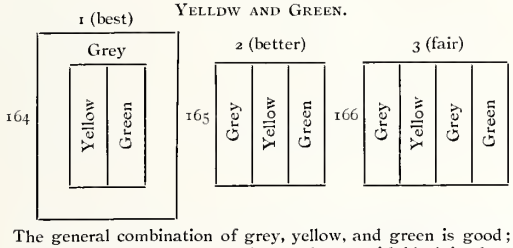
These contrasts are not as agreeable as similar contrasts of orange and green with black or white.

ORANGE AND VIDLET.



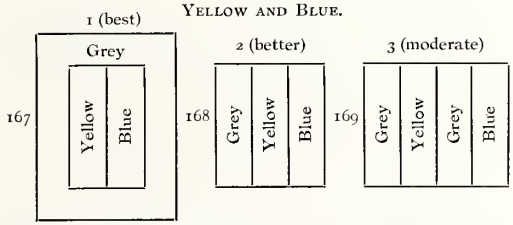
The combination of orange and violet with black is too sombre. A dull grey has not that effect.

YELLDW AND GREEN.



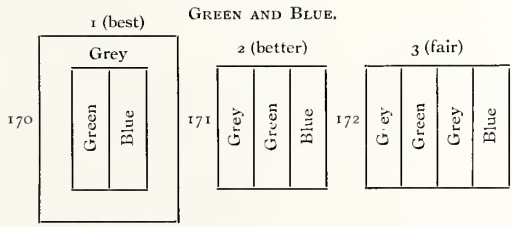
The general combination of grey, yellow, and green is good; but the arrangements 2 and 3 are better with black in place of grey.

YELLOW AND BLUE.



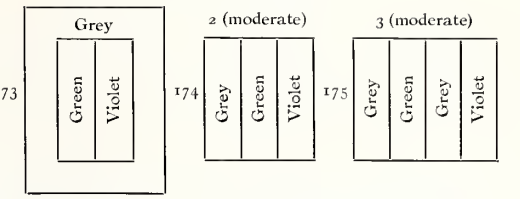
The combination with black in these assortments is slightly superior to the effect with grey; and the combination with white is superior to both.

GREEN AND BLUE.



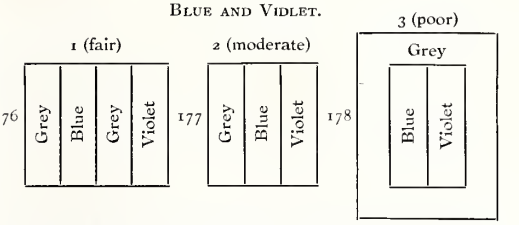
The grey gives this combination a more lively effect than black does; but white is the best contrast.

GREEN AND VIOLET.



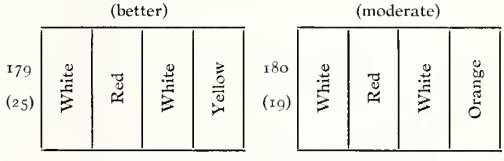
This combination is not quite so good as either the combinations with black or white.

BLUE AND VIDLET.

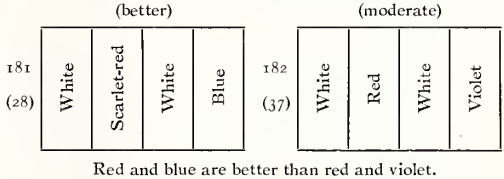


Blue and violet are too sombre to contrast well. The grey accords better with them than black, and relieves the depth better.

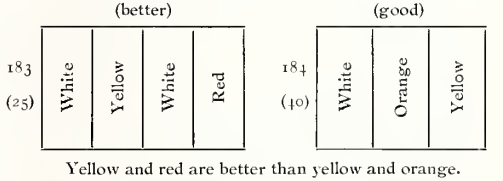
DEDUCTIONS:—The primary pigmentary colours (yellow, blue, and red) associate better in direct contrast with one another than with the secondary colour sensations, viz., orange, green, and purple (or violet). Thus:—



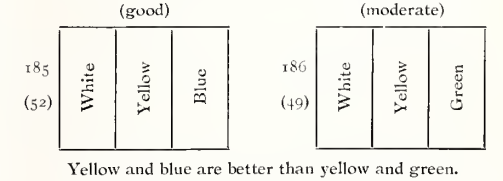
Red and yellow are better than red and orange.



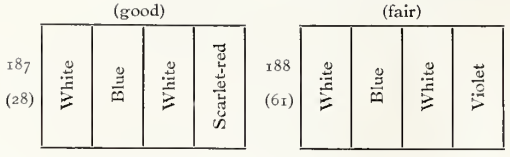
Red and blue are better than red and violet.



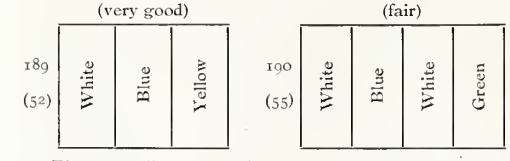
Yellow and red are better than yellow and orange.



Yellow and blue are better than yellow and green.

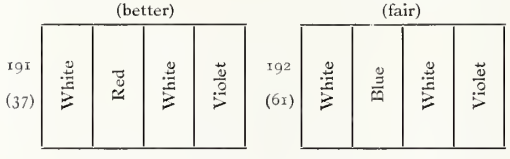


Blue and red are better than blue and violet.

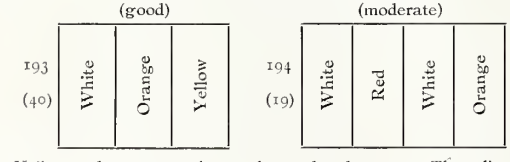


Blue and yellow are much better than blue and green.

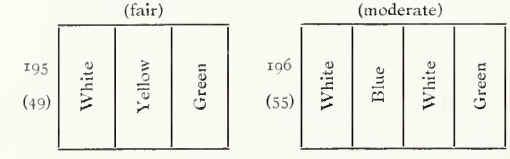
The arrangements of red, yellow, or blue with either of the binary colours in which they form one factor, contrast better with the binary in which the simple colour is the more luminous or strong.



Red and violet are better than blue and violet. The red is more luminous in the violet than the blue.



Yellow and orange are better than red and orange. The yellow is more luminous in the orange than the red.



Yellow and green are better than blue and green. The yellow is more luminous in the green than the blue.

Black does not accord well with two colours, one of which is luminous and the other sombre. The greater the luminosity of the one, the worse is the combination. Black is better associated with two luminous colours, and is often preferable to white in such combinations.

White, when used to separate two colours which accord badly, materially assists in improving the combination.

Grey is generally inferior to either black or white in its association with two luminous colours. Grey assists in separating sombre colours which do not accord well together, and in making a better combination, but these harmonies of analogy are not so good as with black. Grey has a special advantage when contrasting a luminous and sombre colour. It is superior to white when the latter produces too strong a contrast of tone, and it is superior to black when the latter makes the proportion of sombre colours too great.

The principle of symmetry influences the judgment to a large extent. In assorting colours, however badly they accord, or however sombre they may be, the manner of separating them by equal quantities of white, grey, or black, gives them a balance or symmetry which improves the combination.

Again, in the diagrams there has been almost an equal surface of each colour experimented with, including the white, black, and grey; but better combinations are formed by increasing the quantity of one or other of the constituents of any group.

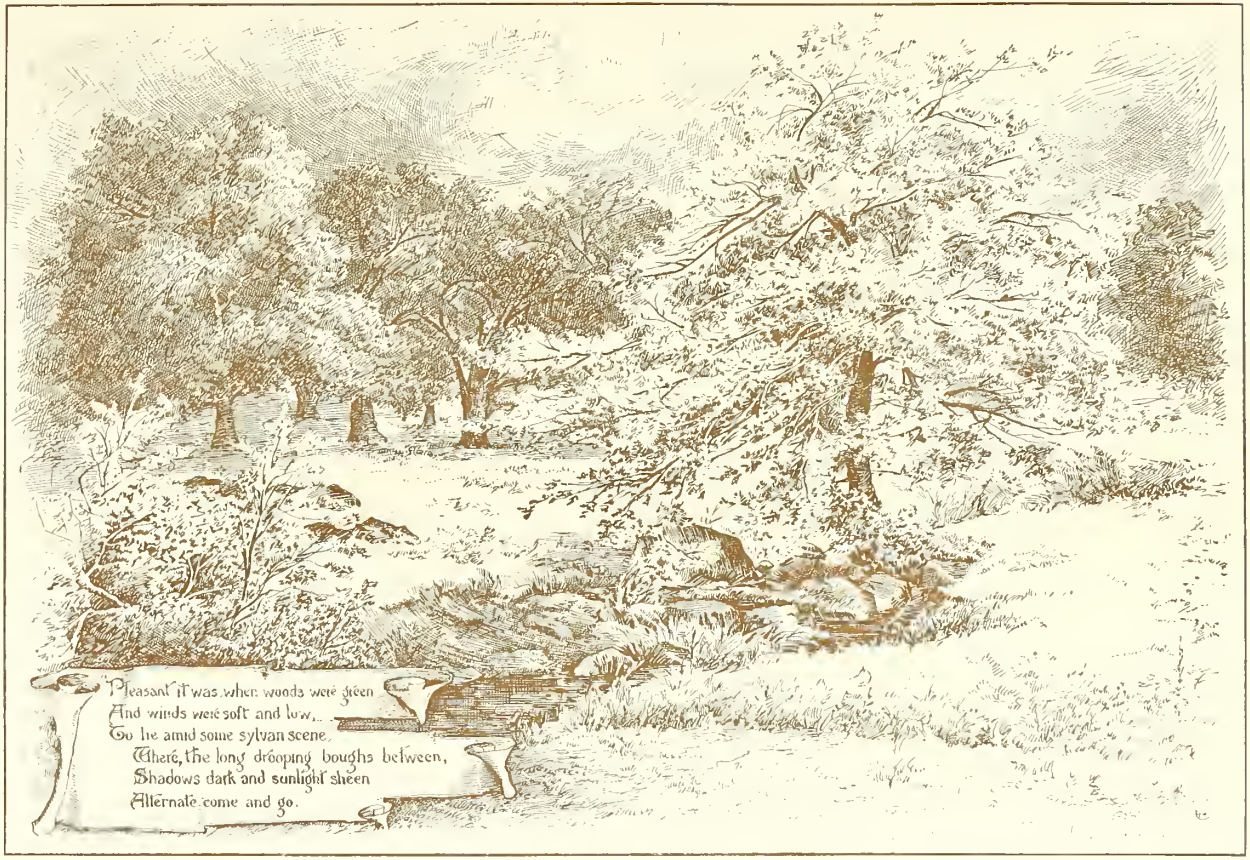
Much depends upon the character of the surfaces or materials which have to be contrasted to obtain either a harmony of contrast or of analogy. Green and black arranged on flat surfaces will give a much better effect than any rougher materials which give shadows and increase the amount of sombre colouring or let in an unlimited quantity of white.

Again, although when colours differ it is advisable to increase the difference, so as to obtain a harmony of contrast, still, when the colours have a strong alliance, it is better to lower them more nearly towards alliance or harmony of analogy, than to try and increase the divergence for the purposes of contrast. This also applies to introducing white, black, or grey to separate the colours. It should be studied whether it will be better to form a harmony of contrast or of analogy.

If it be determined to use a grey, then the grey can be toned with the complementary of the colour in contrast, and thus improve the combination.

[To be continued.]

SUPPOSED ORIGINS OF COPPER-PLATE PRINTING.—One of the following circumstances is supposed to have given rise to the discovery of copper-plate printing:—Finiguerra chanced to cast or let fall a piece of copper engraved or filled with ink into melted sulphur, and observing that the exact impression of his work was left on the sulphur, he repeated the experiment on moistened paper, rolling it gently with a roller. This origin has been admitted by Lord Walpole and Mr. Landseer, but another has also been mentioned by Hüber. "It is reported," he says, "that a washerwoman left some linen upon a plate or dish on which Finiguerra had just been engraving, and that an impression of the subject engraved, however imperfect, came off upon the linen, occasioned by its weight and moistness."



FROM PEN AND INK DRAWING.

The City and Guilds Examination in Lithography, 1894.

QUESTIONS SET ON MAY 2, 1894, AND ANSWERED BY OUR CO-EDITOR, MR. CHARLES HARRAP.

ORDINARY GRADE.

QUESTION I.—Describe the respective merits of leather and metal tympans.

ANSWER: Leather and metal tympans have separate and distinct properties which cause printers to have a liking for one in preference to the other; and to see at a glance the points of difference between these materials, the question is best answered by the use of a comparative table, thus:—

LEATHER TYMPANS.	METAL TYMPANS.
(1) Being skins of animals, are liable to contain patches or streaks of a harder or softer nature, which cannot be eliminated.	(1) Being manufactured, materials can. by careful manipulation, be prepared almost, if not quite, homogeneous.
(2) The thickness and elasticity of leather requires the scraper to be very keen and more tightly screwed down to give pressure equal to metal tympans.	(2) Being thin and practically inelastic, the scraper bites almost directly upon the stone, giving a fine impression with less pressure.
(3) Under leather there is no necessity to use much backing.	(3) Under metal a fair amount of backing should be used to give elasticity.
(4) Leather stretches in use.	(4) Metal stretches in use.
(5) Leather requires a careful preparation with fat and blacklead to ensure its even running under the scraper.	(5) Metal requires only a very sparse preparation.
(6) Leather requires occasional preparations during its "life" to retain its elasticity and even running. This eventually makes the leather greasy underneath, which is dangerous.	(6) Metal only requires a wash with turpentine and an occasional slight greasing to keep it in order.
(7) Leather is liable to be torn, and cannot be mended. If badly torn it must be replaced, at considerable expense.	(7) Metal may break, and cannot be mended, but it can be replaced at a very much lower price than leather.
(8) Leather, by constant use with one range of stones, becomes deeply impressed with the size of that range, and cannot with certainty be used for larger ones.	(8) Metal being so thin becomes readily adapted to any size of stone over which it may be used.

Such a comparison points to the probability that a metal tympan may be considered the more advantageous.

[NOTE.—Question III., Honours Grade, 1891, was somewhat easier than this Ordinary Grade question.—ED.]

QUESTION II.—Point out the utility of etching zinc plates and litho stones previous to printing, and the best methods of operation.

ANSWER: The etching which is apparently intended by this question is the etching previous to printing, rather than the etching previous to the first rolling up, immediately subsequent to the work leaving the artists' hands. Taken in that sense only, the etching of zinc plates and litho stones has a somewhat different bearing in each case.

The etching of the litho stone before printing should have, as its primary object, bringing the work into relief. Its secondary object is to finally clear away any loose particles or small grease spots which may have caught upon it during its recent operations. In either case, it should be remembered that etching opens the pores of the stone, slightly roughens it, and makes it the more liable to catch more fluff or grease, and become tinted. To avoid this, after etching it must be well gummed, and the gum allowed to dry, before proceeding to print.

The etching of the zinc plate is not by any means so decided in its utility as with stone. It may have as its object, bringing the work into relief, or the final clearing of loose particles of dirt. But the most probable use of the etch is to assist the work on the plate to become more firmly adherent, and to act upon the face of the zinc and convert it temporarily into a material which resists grease better than plain zinc does.

The operations of etching differ in the two cases. For litho stone the liquid usually employed is nitric acid. The acid may be strong when relief is to be obtained, or weak when dirt only has to be cleared away. For obtaining relief, the stone should be carefully rolled up in a soft ink, and talc dusted all over the work. The surplus talc must be carefully removed with a pad of cotton wool or a soft cloth. Then the stone can be treated with any strength of nitric acid. Having allowed the etching to continue until the necessary relief is obtained, the stone is well washed with water, and finally washed out with turpentine. Then the work is rolled up well, taking care to use a little gum in the damping water, and, when properly rolled up, the stone must be well gummed up and allowed to dry.

To etch a zinc plate, there are two solutions which may be used, viz.:—A decoction of nutgalls with an addition of acetic and phosphoric acids, or phosphoric acid well diluted, alone. The first solution may be used as a mixture with gum; the latter as a weak solution in water. If the former is used, it may be sponged upon the plate and allowed to dry, after which it can be washed off and the printing proceeded with. If the phosphoric acid solution in water be used, then it is sponged quickly after the plate, and almost as quickly wiped off with a sponge containing water or gum and water. The whole plate having been thus treated, it must be gummed up and dried before washing off and proceeding with the printing.

QUESTION III.—Using a mixture of oil, turps, and gum water for washing out a subject on stone, what are the properties and action of each of the three ingredients used?

ANSWER: The washing out solution, consisting of oil, turps, and gum water, contains two distinct elements: the oil which is ready to grease the stone, and the gum water which will protect the stone from the attacks of the grease. The turpentine in this composition serves but the purpose of a carrier. Oils will mix in turpentine, and in mixing they become divided into the most minute particles. It can be shewn by experiment that if palm oil be mixed in turpentine and well shaken up, the liquid appears to be an almost clear solution of the palm oil; but, when left to stand, the particles of the palm oil settle in a thick sediment at the bottom, thus proving that the palm oil (or any other oil) only mixes in turpentine, and does not become a solution. It is this very characteristic which constitutes the value of the turpentine and oil; for the turpentine, with its penetrating and clearing properties, enters into every part of the work upon the stone, and carries there innumerable particles of grease, which readily become attached to all parts of the stone which have the faintest trace of grease upon the surface. And whilst this strengthening operation is going on, the gum water is flowing over the stone, being repelled from all grease, and settling upon the clean stone to protect it from any attacks of grease. Finally, the turpentine mixes with all removable greasy particles, and forms a readily removable solution, leaving an almost uncoloured impression of the work upon the stone, which has been strengthened by the addition of the oil, and not impoverished by the use of the searching liquid turpentine.

QUESTION IV.—Suppose you have a strongly-written facsimile, with a request to make *two* transfers direct from the same writing, how would you do it?

ANSWER: Apparently in this question, the word "facsimile" has been used with a slightly different meaning to that usually applied. It is generally understood that if a written circular, or anything else of that particular class, be given to an artist to make a "facsimile" writing or copy of, that he uses tracing transfer paper, and traces the circular "facsimile" in litho writing ink. On the other hand, many firms send to the printers circulars, bills of quantities, etc., already written in a liquid transfer ink. Such transfers are known as "autographs," "autograph circulars," or "original writings." It does not seem probable that the question means "facsimile" writings, but rather "autographs."

A strongly-written "autograph" may frequently be run through the press upon a perfectly clean stone once only and leave an excellent transfer. It may then be removed, and a similar transfer be put down from it, upon another stone, without the slightest extra preparation of either stone or transfer. If any preparation be required at all to make the second transfer, there are three ways in which it can be assisted. After running the transfer through once, to obtain the first transfer, the back of the paper may be damped with weak nitric acid, or the stone may be wiped over with a clean turpentine rag, or the stone may be made extra warm. These three courses, or a combination of them, should give a perfect second transfer from the original.

QUESTION V.—Describe the method you would employ in making litho crayons, and the particular use of each ingredient.

ANSWER: To describe the method of preparation of litho crayons, it is necessary to enumerate the materials which are capable of being used. The list contains the following materials:—Soap, wax, shellac, tallow, spermaceti, gum copal, and black. Of these ingredients, soap may form from one-quarter to one-half of the whole chalk compound: it usually constitutes about one-quarter. Taking a very simple recipe, chalks may be compounded from equal quantities of tallow, wax, soap, and shellac, with black added to suit circumstances. Or the proportions may be altered to:—

Tallow	2-oz.
Wax	2½-oz.
Brown soap	1½-oz.
Shellac	1-oz.
Lampblack	½-oz.

To prepare the chalks the tallow and wax are melted together, after which the soap—preferably previously dried—may be added in small pieces. The soap assists the tallow and wax to combine thoroughly. When about half the soap has been added, the heated mixture begins to fume. The fumes may be ignited or simply allowed to pass off. In either case the mass is reduced in quantity, and may be put out when the quantity has diminished by one-third. The remainder of the soap may be added, and the shellac; the latter being added slowly, as it expands on heating, and causes somewhat uncontrollable ebullition. Some makers

burn the mixture again after these ingredients are added. The black is added after all burning is completed. Finally, the mass is poured into greased moulds and cast in sticks for use.

The materials used each serve a definite purpose. Crayons being used as pencils, require to contain a stiff grease, which does not readily smash. Such a grease is added in the form of tallow, which is made rigid by the addition of wax. The wax is also a grease, and performs its part in the actual drawing upon the stone. The shellac gives rigidity, and assists in keeping the tallow and wax together in the minute particles which are drawn on the grain. The soap is used almost wholly as a solvent, to compound firstly the tallow and wax, and finally the shellac, with the other two.

[NOTE.—Question II., Honours Grade, 1891, was, if anything, a simpler question than this one in the Ordinary Grade. The standard seems to advance somewhat rapidly!—ED.]

QUESTION VI.—Describe the preparation of "nap" and "glazed" rollers respectively.

ANSWER: By the preparation of "nap" and "glazed" rollers is understood the "breaking in" of a nap roller and the preparation or making of a glazed roller.

To break in a new nap roller, the main point is to retain the original elasticity in the skin, and raise the nap. To accomplish the first object the skin must be saturated with a non-drying soft oil. There are some forms of oil and fat more suitable than others. Such bodies as paraffin wax and mutton suet dry or set too hard. Thin oils are generally too greasy and too easily disturbed. The most suitable material is a "prepared" lard—being lard without salt—which is a soft non-drying fat of a permeating character, and not over greasy. With any suitable fat—"prepared" lard, etc.—the skin of the roller must be rubbed before an open fire, which assists in the absorption of the grease. When rubbed in at first, the skin soon appears to become saturated; but after a few hours' standing, the skin again seems dry and thirsty. The fat must again be rubbed in until the skin appears wet. After standing for a few more hours, examination will shew if the skin can absorb any more grease. If it is apparently dry, then rub more grease in, until, after standing some time, it still presents a partially wet appearance. It is then sufficiently saturated for a very long time. The next operation is to clean the skin and bring out the nap. By rolling the roller upon an ink slab, using a medium varnish to roll it up in, the bits of loose skin will be pulled out and the nap itself will be raised. This rolling up should be performed two or three times a day for three or four days, and finally no more loose bits will come out, nor will the nap come out any further. The roller is now in good order, and only requires carefully washing with turpentine and scraping to make it ready for use.

The making of a "glazed" roller is very simple. Any worn-out nap will do for this purpose. The object is to make the roller perfectly smooth and impervious to varnish or turpentine. This is done by cleaning the roller well, then commencing a series of coatings of red lead, by rolling it up in an ink made of red lead and varnish. When the red lead has been well rolled upon the roller, allow it to dry. When dry, it may have a preliminary smoothing by polishing it with fine sand-paper. After that, roll it again in red lead to get an even layer of red lead upon it. This second rolling may prove sufficient; if not, give it a third and fourth, allowing it to dry between each; and polish it, perfectly even and ready for use, with sand-paper.

QUESTION VII.—Describe how to prepare a stone that has been printed from for receiving additions of new work.

ANSWER: Stones which have been proved and printed from contain a certain amount of gum in their pores, which cannot readily be washed out. Therefore the preparation of stones for new work after they have once been gummed up requires special care and treatment. The first course is to dissolve all gum, capable of solution, in cold water under a running tap, using a good sponge or the hand to work the gum well out. Next, bathe the stone well in boiling water—not poured on from a kettle spout—time after time, until the stone dries readily after the water has ceased to be poured on. Many stones, after such treatment, are sufficiently clean for new work to be added. But, rather than risk a failure, it is advisable to wash the stone carefully with a weak solution of nitric acid—nitric acid in preference to any other, for it decomposes gum and effectually cleans the pores of the stone from the last traces of it. Keep the solution weak. Wherever possible, polish the places where new work is to be added; or, with a wooden stump and some very fine pumice powder, just polish over the places to receive the work. With these three courses to adopt, there should be no difficulty in securing good new work upon an old worked stone.

QUESTION VIII.—What is the advantage, or otherwise, of employing glycerine in the damping water?

ANSWER: Glycerine is one of the constituents of fat, but has no greasy or oily qualities. It is more of a sugary nature, and, above all, of a non-drying nature. Anything containing glycerine is not likely to dry rapidly, if at all.

Therefore glycerine added to the damping water tends to retain a film of moisture upon the stone, and thus reduces the necessity for damping the stone so often. This is an advantage which outweighs the disadvantages. The latter arise from probable chemical changes which are apt to take

place. First, in etching stones it is very customary to put the sponge into the water bucket. Should any nitric acid get into the bucket, the glycerine is decomposed into an acid. Secondly, in ordinary usage it is likely that acetic acid will get into the bucket, and whilst there it will, with glycerine, form fats. The quantities of acid or fat so formed are so small, and almost improbable, that they need not be taken much notice of, except to guard against their formation.

Glycerine, being a constituent of fat, is always likely to cause a certain amount of decomposition in any other fat with which it comes into contact. Its tendency will be to unite with the acid of any other fat, and liberate more glycerine. This is a circuitous decomposition which is not likely to have much effect either one way or the other.

QUESTION IX.—In what does litho varnish differ from the oil of which it is made?

ANSWER: Litho varnish is prepared from linseed oil, and has certain vital points of difference which make it suitable for printing purposes generally, as against the limited use to which the raw oil can be put.

Linseed oil contains linolein, palmitin, stearin, olein, and probably other oils, as well as mucilaginous matters and ash. Such constituents are antagonistic to ready drying, and the presence of olein makes the oil too thin to serve as a medium for the heavier pigments. Since varnish requires to be of different consistencies to carry various weights of pigments, to suit the different drying qualities of pigments, and to give or take away adhesiveness, it is plain that linseed oil, with one consistence only, cannot serve all these purposes.

Varnish, too, has passed through several stages of burning, and in its final state consists almost solely of linolein. The palmitin, stearin, olein, and mucilage have been burnt out. This gives to varnish a much higher drying quality than is possessed by raw linseed oil.

QUESTION X.—What method other than graining with sand or emery could you employ for preparing a zinc plate for lithographic use?

ANSWER: To prepare zinc plates for use in lithography, it is necessary to give them a grain for a variety of reasons. Such a grain can be put on in the ordinary methods employed for graining stones by the use of a graining muller, with sand or emery powder. Such a course is tedious, and not so even as other processes which may be employed. Since the introduction of patent zinc plates it has been most effectually proved that the sand-blast process, previously applied with excellent results to working out pictures and designs upon glass, can be utilised with great success in graining zinc plates. Another method gives an even surface of grain, which is so much desired, and can be utilised for fine or coarse graining. This method is the etching bath of the zinc-block etcher. A zinc plate immersed in weak acid will, in course of time, have a fine or coarse grain all over it, according to the strength of the bath or the time of immersion. There is still another method which may become more popular when better understood, and that is immersing the zinc plate in the cell of a battery or in an electroplating bath. By attaching the zinc plate to the positive pole of a battery, and putting it into an alkaline bath, the zinc from the zinc plate will commence to leave the plate in fine particles, and go with the current of voltaic electricity across to the negative pole in the bath. In this way the zinc plate becomes gradually dissolved, but after the action has gone on for a little time the plate should be withdrawn and examined occasionally, until quite ready. When sufficiently grained, either in the etcher's bath or electroplater's bath, the zinc must be well washed, and finally cleaned with ammonia to free it from any acid. In either case, one face of the zinc must be varnished with lac varnish or Brunswick black, to prevent it being etched also.

QUESTION XI.—Wherein does transfer ink differ from printing ink, and why is the difference made?

ANSWER: Transfer ink, as its name implies, is used for transferring purposes in contradistinction to printing purposes. Therefore it needs to contain a transferring property which is not required in printing ink. Thus, transfer ink may consist of varnish, printing ink, and litho writing ink; whilst printing ink need only consist of lampblack and varnish, or any coloured earth or metallic compound and varnish. The one thing in transfer ink which constitutes its great difference from printing ink, is the grease or litho writing ink which must be present to give the power of transferring from surface to surface.

QUESTION XII.—What kind of transfers would you employ when making up a sheet of coloured labels, etc., and how would you use them?

ANSWER: In making up coloured labels it is necessary to prepare a full sheet for the key, and subsequently work up the colour stone transfers to this key. The question leaves the matter in a very undecided form as to whether it is the key or colour stones which have to be made up. In either case the same paper may be used, or different papers may be used with equal success.

The key sheet can be patched up with transfers upon any reasonably strong transfer paper.

The colour stone transfers should be pulled upon a good thin, but strong, transfer paper—such as bank post—or upon varnished transfer paper, *i.e.*, transfer composition coated upon a varnished paper. The latter is almost transparent, and

PRINTED WITH MESSRS. GILBY & HERRMANN'S WELL-KNOWN LITHOGRAPHIC INKS.
MANUFACTURED IN LONDON, AT 9 & 11 GARRICK STREET, COVENT GARDEN.
FINE GERANIUM LAKE R 22, AT 4/6 PER LB.
FINE MID CHROME R 165 B. AT 2/- PER LB.

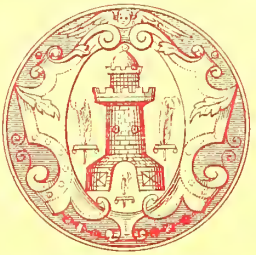
The Arms of the Boroughs & Towns of Great Britain.

Containing various points of note for the artist on the ART of BLAZON.

Chesterfield. M. B.

Derby. 13.242.

Calne. M. B.



Wiltshire. 3.495.

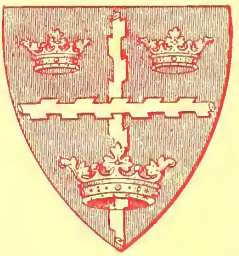
Christchurch. M. B.

Hampshire. 3.994.

Chester. C. B.

Cheshire. 37.105.

Colchester. M. B.



Essex. 34.559.

Darlington. M. B.

Durham. 38.060.

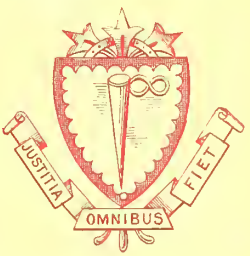
Durham. M. B.

Durham. 14.863

Chichester. M. B.

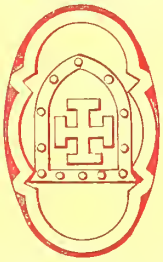
Sussex. 7.842.

Dunstable. M. B.



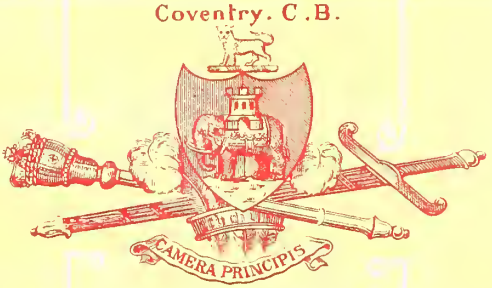
Bedfordshire. 4.513.

Chadderton. U. S.



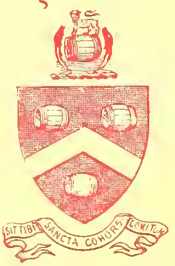
Lancashire. 22.087.

Coventry. C. B.



Warwickshire 52.720.

Congleton. M. B.



Cheshire. 10.774.

assists very materially in patching; but the difficulties attending its use in transferring are sufficient to displace it from favour when compared with a thin strong bank post. By using a shining-up glass, such paper can be most readily applied and fitted into position upon the key; and in transferring it gives no extra difficulties. Whichever paper is used, the composition must be one which is only applicable to cold stone, so as to secure perfect register.

In using such transfers, it is best to have the key impression pulled upon a stout paper or card, or upon a white painted surface upon zinc, or upon paper mounted upon zinc. In the two latter instances, the coating of paint or paper may receive a varnish of lac to preserve it; and it can be used over and over again, from year to year, for the same work.

If the key impression is pulled on any but stout paper, it makes it almost impossible to use bank post transfer paper. Yet, with good eyesight and a little perseverance, this thin paper may be used upon any such key impressions. The value of having the key upon a rigid foundation is that there is scarcely any fear of it stretching. In that respect the zinc plates stand first.

If zinc plates be used for the key impression, it is the experience of such users that all the consecutive colour stone transfers can be patched up to the one key impression. On the other hand, if stout paper or card be used, it frequently happens that a very slight alteration in the conditions of the air makes such a change in a set of transfers that when a later sheet is prepared it will not fit. Under such conditions it is necessary to patch up each subsequent colour sheet, using the impression as far as it is printed as the key for patching, rather than using the original skeleton key.

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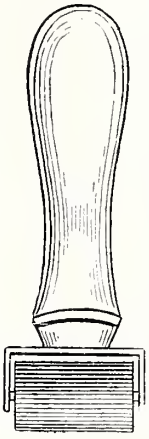
To prepare boxwood for drawing upon, rub over the surface with the finger a little Chinese white moistened with water. When this white coating is dry, rub it over with very fine brickdust. This gives the surface a "tooth" for the pencil, which should be used for drawing on the wood. Tints can be laid on in a wash of dilute Indian ink with a brush. A drawing should be photographed on the wood; there is no other reliable method of transfer. A print from a cut or lithograph can be transferred easily to the boxwood coated with Chinese white. First dissolve a little lye, or caustic potash, in an equal weight of alcohol. Moisten the print to be transferred with this solution, lay its face in contact with the whitened surface of the block, and submit it to a good pressure in a hand-press or with a burnisher, when the ink will almost entirely leave the paper print and be transferred to the block.—*The Inland Printer.*

Hand Transfer Roller.

THE little implement here figured is used for transferring-in small parts such as new sets of branch names on bank cheques, etc., without resort to a press. By means of the hand transfer roller even fair-sized transfers may be as well transferred to a stone while it is in the machine as by the press itself. Take, for instance, a case where pages have been misplaced in fitting up a sheet, and the error is only discovered after the job is set in, possibly, a large machine. Instead of hoisting it out and going back to press again, it is only necessary to well wash the stone with clean water, polish out the errata with smooth-stone, wash the stone thoroughly, make necessary marks with pencil, lay transfers down and firmly roll over them with hand transfer roller. Damp the transfers with cold or hot water slightly, repeat rolling and damping several times until the paper is thoroughly saturated, then wash off. It will be found that in the case of retransfers and type transfers especially the results are equal to press transferring. The stone may be either damp, dry, or slightly warmed with a hot bar for plate transfers.



The diagram is drawn to scale, one-third the actual size. The various parts should be very solid, and strongly put together. The cylinder is of hard wood, uncovered, but should be very accurately turned. The roller can also be used to print small transfers for label work, etc. No transferrer, after possessing such an implement, will care to be without it.—A.M., Dunedin, N.Z.

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IN INDIA, process and general engraving is making rapid strides, progress in this direction being quite as evident as in the other educational movements so enthusiastically and intelligently taken up by the more progressive inhabitants of Hindustan. Thanks to the practical example of Colonel Waterhouse, the Director of the Government Survey at Calcutta, process work is no longer confined to the splendidly appointed Government department, the example being followed by both English and native firms. By the way, those possessing a copy of Colonel Waterhouse's "Application of Photography to the Reproduction of Maps and Plans" have valuable information on simple methods of reproduction of maps and kindred work, no less than details of processes applicable to widely extended subjects.

Purifying Aluminium for Lithography.

SURFACE-PRINTING from aluminium still constitutes the subject of experiment, and close upon the announcement of a successful German method comes a patent granted to John Mullaly, New York.

The inventor says he has found that in order to attain the best results with these plates it is desirable that the aluminium be practically free from impurities, especially those which oxidise readily, and difficulty has been experienced in procuring sufficiently pure metal, certain impurities developing specks upon the plate during its manipulation, which were apt to take the ink, and so mar the impression taken from the surface of the plate. After careful investigation and experiment, Mr. Mullaly announces (in his patent specification) that he has devised a method of obviating this difficulty. His invention consists essentially in removing the impurities at the surface of the plate, prior to the imposition of the design to be printed therefrom, by means of an acid against which the aluminium itself is proof. By this means he prepares and successfully uses, in surface-printing, an aluminium plate that would otherwise be useless for the purpose. Absolutely pure aluminium is an article difficult to obtain commercially, so that by overcoming the objection to the use of the inferior or contaminated aluminium obtainable in the market, he not only perfects, but also cheapens, the surface-printing plate, while claiming to attain results that are more certain and uniform in so far as the prints are concerned. An inferior grade of aluminium may thus be used in the formation of a surface-printing plate, and made to give as good results as a plate made from practically pure aluminium, which latter would cost several times the price of the former. The difficulty of procuring sufficiently pure aluminium commercially, and the cost of the same, are cited by the inventor as rendering his process of eliminating the impurities from the surface of a plate in which aluminium predominates of especial importance in the art.

In carrying out the invention he forms the plate from a suitable quantity of aluminium, procured commercially or otherwise, in the usual manner. After the plate is in shape, he treats the surface upon which the design is to be imposed to a wash or bath of a dilute acid having little or no affinity for aluminium, as nitric or other acid, which will attack the iron and other impurities ordinarily permeating common aluminium, combining with them so that they may be washed out and away without affecting the pure aluminium. This treatment with acid may be resorted to either before or after the graining of the plate, but must be prior to the imposition of the design, otherwise the latter will be injured by the acid. He prefers, however, to grain the surface of the plate before eliminating the surface impurities, since the operation of graining exposes the surface impurities more effectually to the action of the acid without impairing the grained surface.

Mr. Mullaly says he is aware that acids have heretofore been used in connection with printing-surfaces for the purpose of etching the stone or plate itself. The object sought and attained by his invention is just the reverse of this. He purposely employs an acid that will not affect the aluminium, but that will attack various impurities exposed in the surface of commercial aluminium and remove them without disturbing or impairing the surface of the aluminium on which the design is to be imposed. There is no etching of the plate itself; he has simply rendered what is known as commercial aluminium, as distinguished from the laboratory or chemically pure aluminium, suitable for surface-printing by quickly and cheaply removing from the surface impurities that would take the ink and impair the prints.

He has found that nitric acid, diluted with 10 to 20 per cent. of water, is convenient and effective. The strength of the solution and the length of time in which the plate is subjected to the action of the acid solution, vary with the grade of aluminium under treatment, there being several commercial grades of the metal. The purification of the printing-surface is effected by either spreading the acid solution over such surface, or by immersing the plate bodily in the solution, the surface being exposed to the action for several hours, sometimes for twenty-four, if the plate is of low grade.

We understand that quite apart from the firms of printers experimenting with the plates, a company has just been formed for the purpose of actually putting the aluminium plates on the market. Enquirers who have asked for information on this point, should write to the United States Aluminium Printing Plate Co., New York, who are issuing a portfolio of prints shewing various grades of work produced on aluminium plates. While the highest classes of work are not represented in these specimens, yet the productions shew in a most satisfactory manner the rapid strides being made in the development of the new plate.

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THE Society of Amateur Photographers of New York will open an exhibition of Photo-Mechanical Prints and Printing Processes on November 26th. Prints and plates from any process in which photography is employed may be exhibited. The editor of *The Photogram* will act as European secretary.

Trade Reports.

LIVERPOOL.

MESSRS. BLAKE & MACKENZIE'S twenty-first annual picnic was celebrated at the picturesque Vale of Llangollen on Saturday, July 17th. The party, numbering one hundred and fifty, proceeded via Chester and Wrexham, one of the most interesting portions of an enjoyable day being the drive amongst the surrounding Welsh hills. We have received a copy of a handsome photo group duly presented to the members of the party. This measures 12 × 15-in., and was printed direct on zinc from a half-tone lithoplate negative, transferred to stone and two tints run in. The handsome photo of a handsome group forms a worthy souvenir of the occasion.

EDINBURGH.

TRADE remains much the same, although there are signs of a slight improvement.

THE TECHNICAL CLASS has been arranged to start at the end of October, in the Heriot-Watt College, Chambers-street. Mr. Cumming, of Messrs. McLagan & Cumming, has consented to take a large share of the practical work in connection with the class, and Principal Ogilvie is arranging with several gentlemen to give lectures and demonstrations on other subjects of a special nature. Messrs. Furnival & Co. are kindly supplying the press, and Messrs. Shackell & Edwards have sent samples of their inks and varnish, for the use of the class in demonstrating. About forty names have been entered as intending to join the class, and more are expected when the handbill with the subjects to be taught has been issued by the College. The class promises to be a success and a boon to the trade generally.

DERBY.

THOUGH the collotype trade is good, trade is only moderate in the lithographic business. The Society reports three members unemployed, and the prospect is anything but cheering.

THE twenty-ninth annual excursion of the employés of Messrs. Bemrose & Sons, Ltd., took place on Saturday, August 11th. Arrangements had been made for excursions to London, Blackpool, and Manchester; and the party this year was so numerous that three special trains were chartered to convey the employés and their friends to their holiday haunts. The heavily laden trains started at 5.20 a.m.: one for London, and the others for Blackpool and Manchester, respectively. The London train reached the Metropolis shortly after nine, and a happy day was spent amongst the wonders of the great city. The return train did not start till 10 p.m., so that a full day was allowed for enjoyment of the sights. The Blackpool trains arrived at their destination about 10 a.m., and this famous watering place offered the fullest attractions for which it is noted. The return trains left Blackpool about 8 p.m. The weather being fine, a most enjoyable day was spent. The firm presented each employé with a railway ticket, in addition to paying the day's wages, and it need hardly be said that this generous treatment was very highly appreciated. Special facilities were granted for a week's stay, of which a good number availed themselves.

THE remains of the late Mr. John Howard Wilkins were interred on Saturday, Sept. 15th, amidst widespread tokens of mourning and sympathy. Mr. Wilkins, who was a son of the late Mr. George Wilkins, died somewhat suddenly at Duffield. He succeeded four years ago to the printing business carried on by his late father, and in the following year had a severe attack of influenza, which necessitated his removal to the milder climes of Madeira and South Africa. He returned to England in April last, but made no headway towards recovery. Amongst the numerous wreaths and crosses sent were those from the employés of the Wilkins Printing Co., those of W. G. Wilkins & Co., Ltd., and the employés of Wilkins, Ellis & Co., Peter's-street.

THE plant and stock of Wilkins' Printing Co., Ltd., were sold by auction on Tuesday, September 18th, the announcement of the sale stating that the company was relinquishing business.

HUDDERSFIELD.

TRADE in litho departments has not been so brisk during the last two months, as in the previous months of the present year, but an early improvement is expected.

ANNUAL PICNIC TO WORKPEOPLE.—On Saturday, September 1st, the employées of the firm of Alfred Jubb & Son, Ltd., Albany Works, Huddersfield, visited Woodhead and Dunford Bridge. The waggonettes left the works at 8.45 a.m., and proceeded by way of Lockwood, Holmfirth, and Holmebridge, *en route* for Woodhead. Woodhead is situate about thirteen and a half miles south of Huddersfield, and is on the borders of three counties; it is also noted for its reservoirs, the property of the Manchester Corporation. The road to it leads through some of the finest moorland scenery in Yorkshire, everything is wild and grand, no habitation is to be seen for a considerable distance, and the country abounds in grouse. The party arrived at the "George and Dragon," Woodhead, at 12.30 p.m., where luncheon was provided. At 2.30 the journey was again resumed to Dunford Bridge, which is about five miles north-east of Woodhead. On the way the party was photographed by one of the members. Dunford Bridge was reached about 4.30, where a substantial tea was provided at the "Stanhope Arms," to which eighty-one sat down. After tea, dancing and games were indulged in until seven o'clock, when the return journey was made.

Technical Notes.

EXAMINATION RESULTS.

LONDON.

REGENT STREET POLYTECHNIC AND CONTINUATION SCHOOLS.

*Read, V. C.	1 O	Newman, H. J.	2 O
Cam, W. G.	1 O	Pritchard, W. T.	2 O
Terry, R. E.	1 O	Walker, Wm.	2 O
Connolly, F. J.	2 O	Wiles, L.	2 O
Williams, H.	2 O		

* 2nd Prize (equal £1) and Bronze Medal.

THE syllabus for the '94-5 session, which has been forwarded us, amply demonstrates the far-reaching influences of this huge educational centre. Evening classes alone include nearly two hundred different subjects, and the useful arts, sciences, and general trades receive every attention. Amongst those specially interesting to lithographers is the class in lithography conducted by Mr. W. Layton Wilson, meeting on Wednesday evenings from 8 to 9-30. The photo-mechanical section is very complete, including classes in drawing for reproduction, collotype, zinc etching, photo-lithography, copper etching, photogravure, and air-brush work.

It is interesting to learn that the Polytechnic Classes are receiving every appreciation, over 11,000 students for the various classes being on the books from September, 1893, to June, 1894.

LIVERPOOL.

Gowans, John	1 O	Benson, James	2 O
Sherridan, Francis	1 O	Wade, Robert	2 O
Firth, Reginald H.	2 O	Jump, Thomas W.	2 O

Ten sat for examination; four failed, three in Honours, one in Ordinary. Sixteen attended class throughout the session.

Mr. Honeyman, the respected instructor, has declined the position for the coming session, on account of the heavy work entailed during the winter months. We hope he will be at his old place the following session.

LEICESTER.

Skinner, A. H.	1 O	Wells, T. W.	1 O
Beazley, E. E.	2 O		

MANCHESTER.

MUNICIPAL TECHNICAL SCHOOL.

Armitage, W. H.	2 H	Wildman, J. R.	2 O
*Coups, E. A.	1 O	Hough, W.	2 O
Pemberton, R.	1 O	Sale, H. J.	2 O
Middleton, W. H.	2 O	Worthington, J. W.	2 O
Cartwright, F.	2 O	Blackburn, A.	2 O
Nolan, F.	2 O		

* 2nd Prize (equal £1) and Bronze Medal.

No classes in lithography were held last session at Derby, Borough-road Polytechnic, Aldenham Institute, and Birmingham and Midland Institute, nor are any projected for the session 1894-5 at these centres.

THE Glasgow and West of Scotland Technical College reports that none of the students in lithography went forward to the City and Guilds examination.

The prospectus for the Industrial Art Department for session '94-5 shews a very complete list of useful classes. Amongst them is a class in lithographic drawing and design, taught by Messrs. J. G. Murray and Clouston Young, meeting on Tuesdays and Thursdays, 7-15 to 9-15 p.m. The section devoted to lithographic printing meets on Wednesday at 8-30. The class syllabus evidently embraces the whole art of lithographic printing, from the chemical composition of litho stone up to bronzing and printing on tin, although there is a saving clause, "as far as possible." Mr. James M. Dodds is the instructor.

THE Photographic Exhibition, held at the Royal Aquarium, Westminster, has proved most successful in many respects. The actual exhibits were very numerous, and historically, technically, and progressively, the collection proved of the highest interest. Specimens produced by photo-lithography, photo-mechanical processes, and collotype were amongst the strongest features of the exhibition.

THE new Ordnance Map of London, on the scale of five feet to the mile will, it is expected, be completed before the end of 1896. The 752 sheets are to be reproduced by zincography.

MANCHESTER.

RESULT OF APPRENTICES' EXAMINATION IN LITHOGRAPHY, HELD APRIL 28th, 1894.

Shewing the numbers of questions set, the marks offered for each answer, and the full marks obtained by the answers:—

Candidates' Names.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total.
	20	20	20	30	25	20	15	25	25	20	15	20	30	15	
R. Pemberton	15	10	15	21	16	14	..	..	..	11	..	9	*	*	111
E. Tordoff	8	15	..	..	..	..	6	15	15	..	4	11	12	..	86
F. Nolan	15	18	..	20	..	..	6	..	5	9	3	..	..	6	82
W. Hough	15	5	..	..	..	6	..	10	10	..	5	12	..	6	69
J. W. Worthington	12	..	..	17	..	..	..	..	..	13	..	..	..	3	45
A. Blackburn	6	5	13	..	..	..	*	2	2	8	5	..	..	2	43

NOTE.—All questions above *eight* which have been answered are cancelled (*).

STRENGTH, TRANSPARENCY, ABSOLUTE PERMANENCY, AND EASY WORKING.
WILL STAND VARNISHING WITH SPIRIT VARNISH.
THE FINEST QUALITIES IN ALL SHADES OBTAINABLE, OF
A. B. FLEMING & CO., LTD., CAROLINE PARK, EDINBURGH.
15 WHITEFRIARS STREET, LONDON, E.C.
FINE COLOUR DEPARTMENT: 101 LEADENHALL STREET, LONDON, E.C.

SAMPLES AND QUOTATIONS SENT ON APPLICATION.

PRINTED WITH DEEP CRIMSON MADDER LAKE,	L. NO. 1125,	7/– LB. LETTERPRESS;	8/– LB. LITHO;	8/– LB. DRY.
ROSE MADDER LAKE,	,, 1057,	7/– ,, ,,	8/– ,, ,,	8/– ,, ,,
INDIAN YELLOW,	,, 1059,	4/6 ,, ,,	5/– ,, ,,	4/– ,, ,,
FINE BLACK LITHO INK,	,, 30X,	– – – –	3/– ,, ,,	

Trade Notes.

A DETAILED examination of the Specimen Books shewing Messrs. Alex. Baird & Sons' new season's Dance Programmes afforded us a considerable amount of genuine pleasure. The firm has a reputation to maintain, and it needs but little observation of their present work to shew that not only have "The New Art Embossed Series of Dance Programmes" contributed to this, but the publication of the cards in question has materially furthered Messrs. Baird's name as doughty pioneers in the advancement of high-class "British-made" productions. Not even the most exacting of customers need turn to "made-abroad" dance programmes to satisfy a demand for original and tasteful work.

The two books received are a Comprehensive Sample Book for travellers' use, which is issued to wholesale houses only, and the other a Condensed Sample Book, issued to lithographers, printers, and exporters for counter use, and may be obtained at the nominal price of 1/6. The series includes some two hundred and fifty designs, with a wide range of subjects and style of treatment, the prices ranging from 5/6 to 12/6 per 1,000. In the larger book, four cards are presented on each page, shewing variations of the same design and as folders or single cards. All cards have scalloped edges, and dainty soft colours and tints prevail throughout.

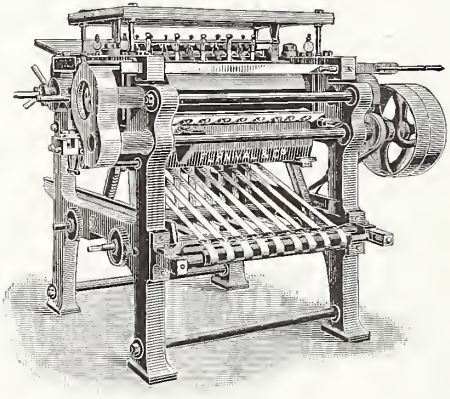
The designs are evidently all from the same master-hand, the style being a sort of rococo combination, with mosaic groundwork, original and effective treatment being apparent throughout. The front page is, in each instance, occupied with a special design, and we will specify a few here and there. Nos. 1076 to 1079 shew the charmingly coloured figure of a lady violinist on toned ground, over which trails beautifully tinted briar-rose sprays; an ornamental band at top right-hand corner is daintily shewn in old gold and pale blue; the lettering—in a free grotesque—running across the page. No. 850 is a type of a series conspicuous for simplicity and boldness, the lettering being embossed in green and gold, with initials in bright red. Nos. 1060-3 shew ornament in top left-hand corner, in which a pale-blue centre is crossed by title, the centre design including a table lamp with a lady's slipper and a half-opened fan, effectively produced in colours.

The toned ground is daintily over-run with delicate sprays of briar roses. In Nos. 991-4 a diagonal band of coloured mosaics, with sky-blue centre, ring, birds, and pendant fan, forms a very effective and tastefully worked out design. Nos. 1024-7 include a particularly tasteful design shewing handsome table lamp, against which leans a roll of music and a dance programme; a delicately shaded background and richly coloured mosaic headpiece further complete a strikingly attractive front page. Nos. 1004-7 shew a design in which an open fan and rose-coloured slippers are centres. In Nos. 974-7, a pair of dancers, charmingly outlined in colours and gold on ground of briar-rose tracery, form a most appropriate subject, the effect being exquisite. Nos. 1016-19 shew a pastoral idyll—shepherd boy playing pipes; the design, with title at head and ribbon in blue and gold, proving most pleasing in result. Nos. 1184-7 are luxurious productions. Masonic emblems in centre, with a wealth of ornament and mosaic on delicate rose-coloured ground, are tastefully conceived and excellently carried out. Nos. 1000-3 shew tambourine, with picture of coquettish damsel, forming an attractive design. Nos. 1012-15 shew a violin resting on open music book, and most tastefully finished in colours and gold. Needless to say, the well-known skill of Messrs. Baird in embossing is prevalent throughout, the embossed effects being applied with discrimination and true taste.

The cards specified are types of a large series, and are simply excellent in design, colouring, and finish. The same degree of skill and taste in production is evident throughout the entire collection; and as specimens of high-class lithography,

we are glad to have had the opportunity of recommending them to the favourable notice of all dealing in dance cards. The pleasure derived from the best arranged dance party—be it "hop," Cinderella, impromptu, or however elaborate—is much enhanced by the provision of appropriate cards, and the dainty and tasteful productions of Messrs. Baird are amongst the very first and most pleasing of the season.

THE accompanying illustration of Hot Rolling Machine should have appeared in the notice of Messrs. Furnival's machinery on previous pages, but arrived too late for insertion. We are



informed by the makers that upwards of three hundred are at work in various parts of the country, and new machines are being made in pretty considerable numbers.

CONCERNING the stone-grinding and polishing machine of Messrs. Alex. Seggie & Son, a pleasing proof of its merits is the fact that one Paris firm has ordered seven of them in succession—the last to take stones two mètres in length—about seventy-nine English inches. These machines are also being used very successfully for preparing zinc plates, and the Variable Speed Friction Apparatus is invaluable for this purpose. The constant gain is in the better surface obtained compared with hand preparation, the consequent saving of the time at the printing machine with its attendants, and also in the saving of the breaking of stones and the loss of work. Orders are regularly received for label punching machines of both the types made by Messrs. Seggie, the one being more suitable for large sized dies and the other giving a specially large output where the dies are not beyond say 12-in. diameter. Copperplate presses, of which they have now made several thousands, are having a special run at present, together with the rotary card cutting machines and combined rotary card cutting and sewing machines. These machines are made by means of special appliances of great precision.

WITH reference to an adverse criticism of the "Rapid" Stone Cleaning Preparation, in B.L. No. 18, we have received a communication from the manufacturers which we give herewith :—

To the Editor of THE BRITISH LITHOGRAPHER.

DEAR SIR,—In No. 18, vol. 3, of your esteemed journal Mr. H. E. Grantham gives an unfavourable report regarding our Stone Cleaning Preparation, "Rapid," therefore we ask you to kindly insert the following reply :—

In our opinion the staff of the firm in question cannot have strictly followed the instructions. When properly applied failure is impossible. If the ink is washed out and the etching removed by grinding with pumice (which only requires three or four minutes), then the whole surface rubbed over with the "Rapid" (and powdered pumice) for a few minutes, and afterwards carefully rinsed with clean water, the stone is just as ready for use as if ground in the ordinary way. The "Rapid" does not make the stone rough, but *smoother* than grinding, and more sensitive to take the new transfer, as the stone cannot absorb so much water by this process. This chemical preparation does not destroy the stone, but merely dissolves the grease and acids, so that the surface is freed from these substances. If the work on the stone is some years old, a longer application of "Rapid" is necessary. After some practice the effect of the "Rapid" is absolutely reliable.

It is suitable not only for cheap work, but for the very finest and for every kind of transfer work. The advantages which the "Rapid" offers are so important that the practical man should not be discouraged by the failure of the first experiment.

Numerous testimonials and acknowledgments of high-class lithographers confirm our claims, and hundreds of firms—large and small—have been using the "Rapid" for some time with the best results. Yours faithfully,

(Signed) ARNOLD BROS.

Appreciative letters from Messrs. Timbey and Co. (Belfast), Blake & Mackenzie (Liverpool), S. H. Cowell (Ipswich), *Observer* office (Bournemouth), and Wm. Hobbs & Sons (Maidstone), which have been forwarded us, all speak emphatically of the advantages of the "Rapid" as a stone cleaner.

THE terrible fire which almost totally destroyed the famous Crown Point Printing Works, Leeds, on the morning of September 30th last, caused a loss not only to Mr. Alf. Cooke, but to the lithographic world in general. The splendidly equipped building, with its large stocks of completed and partly finished work was reduced to ruins, the damage being enormous. We deeply sympathise with Mr. Cooke in the calamity which has overtaken him and with his staff on the loss of employment, and trust that the measures being undertaken with a view to an immediate continuance of the work, will be successful.

A New Paper Maturing Appliance.

THE proper exercise of lithographic methods taxes the ingenuity and makes constant calls on the patience and perseverance of the worker, but probably the changing conditions of the printing paper "takes the cake" as an annoying and always-to-be-reckoned-upon factor of lithographic printing. This, of course, applies to the unequal stretching of the paper used for general printing, particularly for colour work. With an amount of persistence and adaptability—almost worthy of a better cause, we were going to say—the pressman daily copes, more or less successfully, with difficulties inherent to the paper supplied, and each house thus has some pet method of its own of remedying such annoyances. In spite of this there are so many objections raised from time to time to existing appliances that one cannot fail to note there is a real and widespread demand for a fully reliable general paper maturing appliance.

At the invitation of Mr. Jubb (Messrs. Alf. Jubb and Son, Ltd., Huddersfield) we made a detailed examination of a new maturing appliance—the Jubb and Chalmers' patent—which is well worthy the immediate attention of the trade. As with so many other useful and ingenious appliances, this invention is simplicity itself. Briefly speaking, it consists of substituting a brass feed board for the ordinary one. Immediately under the lower surface of this board is a series of Bunsen burners, the flame from which acts directly on the under side of the brass plate. In actual working, the sheet is fed into the grippers, and meeting with the heated air over the metal plate, is perceptibly, though momentarily "drawn," passing on to the cylinder perfectly ready for any working, first or otherwise. Noting its actual work on a double demy machine, we are led to believe that its advantages may be summed up thus :—

Being an integral part of the machine, extra floor space and the carrying to and fro of paper are unnecessary ; there are no parts to get out of order ; the whole is easily regulated ; the heat does not affect other parts of the machine ; the cost of gas is remarkably low—the average being 100-ft. in twelve hours. Tests with a two-colour box label, 28 on double-crown sheet of 30-lb. paper, were perfectly satisfactory, and we were assured that the combination of advantages was much appreciated in the machine-room, the small cost of fitting the appliance being soon recouped.

Messrs. Geo. Mann & Co., Leeds, have undertaken to fit machines with the new appliance, and full particulars may be obtained from them or from Mr. Jubb. Just as we go to press, we learn that the invention is finding practical appreciation, and Messrs. Mann & Co. are supplying Messrs. Martin Billing, Son & Co., Birmingham, with the appliance.

Answers to Correspondents.

"SPOOL TICKETS" asks : "What is the best copal varnish for varnishing spool tickets, where got, and if possible, price?" This is an important trade question, and if any of our readers have been troubled with varnish turning yellow after the sheets have lain for some time, they will sympathise with the enquirer. We shall be very pleased to receive any suggestions as to best varnish for this class of work.

"ZINCOGRAPHY" says : "In your last issue you have an article, 'Aluminium *versus* Litho Stone.' I hope you will give us some more information about it, and also point out its advantages, if any, on zinc plates."

The notes on pages 14 and 26 deal with the matter as suggested by our correspondent. Beyond this, the experiments proceeding are not conclusive enough to pass judgment upon.

"L.S." — No ! *The American Lithographers' Journal* should be obtained direct from the publisher, W. M. Patton, Philadelphia, U.S.A. The foreign subscription is three dollars.

* * * * * * *

Correspondence.

"Resolis," New Alma-road,
Portswood, Southampton,
September 20th, 1894.

To the Editor of THE BRITISH LITHOGRAPHER.

DEAR SIR,—As a constant reader and admirer of THE BRITISH LITHOGRAPHER, I am anxious, with others, to see the first part of your fourth volume, and I wish it every success. I have before me *The Lithographer* for 1874, and your last volume for 1894, and the change is marvellous.

I think it is time that some preparation was being made by THE BRITISH LITHOGRAPHER, as the leading lithographic journal, for the celebration in some way of a centenary exhibition of the invention of lithography. I believe 1896 would be the proper date. Before the Caxton celebration took place in 1877, a splendid committee and sub-committees were formed, and the collection made was of such a nature that it has added greatly to the history of typography. Why should lithography and its allies be behind? Unlike typography, there is no dispute about Senefelder being its inventor. Hoping that some of your numerous readers will take the matter up,

I remain, yours truly,
T. HOLMES.

Prize Competitions.

THE MENU COMPETITION.

COMPETITORS should always keep the conditions well in view when preparing their sketches. It is very difficult to award the prize, owing to the fact that the designers of the sketches seem mostly to be unaccustomed to sketching for making process blocks or line blocks. Our competitions have two purposes in view, viz. : (1) to obtain a good standard of designs, and (2) to give practice to artists and engravers in drawing black drawings, especially for line block production.

It is with these points in view that we are compelled to pass over some of the more delicate designs, and award the prize to a design which shews considerable ability, coupled with the fact that it can be easily produced as a block.

The prize of One Guinea is awarded to :—

DONALD MCPHERSON,
13 Glenallen-street,
Mountpottinger, Belfast.

Of the other designs, that submitted by "Rodos" is excellent in drawing and style, but could be made more appropriate to the subject in hand, without losing any of its beauty of style.

"A.E.O.'s" design is just too symmetrical. The same matter displayed in a better manner would make a first-rate menu.

"W.J.'s" design is certainly very pretty, and very nicely worked out. It is garnished too much with matter not really appropriate, and omits some strong points in a menu.

"Noslius's" design, for his age, is very good. But a menu design will readily admit of the introduction of more than fruit and wine, if such subjects are intended to form the chief features of the sketch.

"A.S.D.'s" (Hull) design is too thin. There is the essence of a good thing in it, but it requires working up.

"Camillo" has trusted rather to the design than to its production. He should be aware that firstly the tint work cannot be produced by line block, and secondly the drawing is really too primitive to allow of its favourable consideration.

All the designs shew that the competitors have made most creditable efforts to produce really good things.

The Prize Design is reproduced on page 3.

ESSAY COMPETITION.

THE essay by the "Modern Athenian" is certainly the best sent in, but he has quite failed to touch upon the practical side of the question. It is the practical side, and not the sentimental side, which is the real reason "Why Lithographers should be Photographers."

We cannot make any award in this section; perhaps the subject may be touched upon in some future competition.

COMPETITION E.—We offer a prize of

ONE GUINEA

for the best design suitable for

A FLORIST'S TRADE CARD.

The design to be in black ink on white card, and not to exceed $8 \times 5\frac{1}{4}$-in. The design to be drawn in a manner suitable for zinco reduction to about one-third the size of the sketch.

COMPETITION F.—We offer a prize of

ONE GUINEA

for the best series of hints on

"LITHO MACHINE MANAGEMENT."

This should produce a valuable set of hints concerning the proper utilisation of the capabilities of the litho machine.

RULES.

1.—The essay must not exceed 1,000 words (the longest essay will *not* necessarily secure a prize).

2.—All papers and designs may be signed with a *nom de plume*, but the correct name and address of each competitor must accompany each paper or design submitted.

3.—All papers and designs for competition must arrive on or before Saturday, November 10th, 1894. The award will be published in the December-January issue.

4.—Competitors should address essays and designs for competition to The Editor, BRITISH LITHOGRAPHER, De Montfort Press, Leicester, and envelopes should be marked "Prize Competition" in the top left-hand corner.

5.—The decision of the Editor must be final.

6.—The Editor reserves to himself the right to publish any essay or reproduce any design sent in as worthy of mention besides the successful paper or design.

7.—The Editor cannot hold himself responsible for the return of unsuccessful papers or designs.

NOTE TO COMPETITORS.—Essays must be written on one side of the paper only.

VOL. IV.—NO. 20. DECEMBER-JANUARY, 1894-95. PRICE EIGHTPENCE.

ISSUED EVERY OTHER MONTH, ABOUT THE END OF SEPTEMBER, NOVEMBER, JANUARY, MARCH, MAY, AND JULY.
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CONTENTS.

INDEX TO MANUFACTURERS.

Concerning our Supplements.

THE reputation of **Messrs. W. R. Royle and Son** as first-class steel and copper-plate engravers and printers has withstood the test of time, and to this recommendation must be added the pleasing evidences of enterprise displayed in the appliances used, the modern work turned out, and the commendable promptness and reliability with which they proceed with orders. The specimen of their engraving shewn in this issue is a good example of what is known as the American style of engraving—deservedly popular for many classes of commercial work.

AFTER reading what is said on page 59 concerning the madder lakes manufactured by **Messrs. Mander Brothers**, the supplement shewing four specimens of these colours will be examined with interest. In these lakes "a long-felt want" has been supplied.

IN the sketch, "**Memories**," shewing a dreamy maiden seated beneath the branches of a tree, we have a fair example of simple colour work.

AS a suitable subject for fan decoration, the **Landscape and Floral Design** presented in colours is a pretty conception and a capital piece of work. We take this opportunity of recognising the care and ability exercised by Messrs. Widdowson & Co., King-street, Leicester, who printed this supplement, and who are likewise responsible for the printing of the much admired and excellently printed tomato label subject in last issue. They possess a capable staff, first-class plant, and produce some exceedingly good chromo work, their facilities allowing them to undertake all kinds of commercial and general work.

[See also page 64.]

The Annuals.

THE question which suggests itself year by year as the annuals are presented each Christmas, is, how much longer will our leading periodicals continue to publish chromo-lithographic plates as art supplements? It may be said that there is no question about it—of course, they will continue to issue plates. But when the matter is thoroughly discussed, it may safely be asked, what good are these plates? They give a transient pleasure, and in the majority of cases become playthings for the children. It must be admitted that the plates add a little life to our railway bookstalls and stationers' shops, and even cause a flutter in the homes of many. From that standpoint alone it may be well to continue them, although the general public is satiated with them, and has had as many framed as are fit for the purpose. There is one other slight advantage, as shewing that several periodicals still continue to get their plates printed on the Continent, in face of the splendid lithography done in England. Evidences of this can be seen at once in *Pears' Annual* and the *Lady's Pictorial;* whilst the "Ray of Hope," with *Chatterbox,* printed in Holland, cannot be compared with English workmanship. On the other hand, the English production of "Hide and Seek," with *Yule Tide,* is far behind the Berlin work in "Reflections," with the *Sporting and Dramatic Annual Holly Leaves.* Other specimens of Continental work can be seen in the plates given with *Weldon's Journals,* which are really too smooth to be picturesque. The remaining advantages are purely technical, illustrating so many different modes of colour printing on paper and on fabrics. Taking the journals one by one, the foremost position is held by:—

"Horner's Penny Stories."

A PAIR OF LOVE-BIRDS.

Pears' Annual, with its three excellent chromo plates—"The Fisherman's Wooing," by Eugéne de Blaas, being, as it were, a composition from the picture, "The Rival Belles," by Eugéne de Blaas, published with the Christmas number of the *Illustrated London News* of 1891, and undoubtedly the finest plate published in 1891. The plate is printed in London, and for workmanship in drawing and printing could scarcely be better. Both this plate and "The Christmas Offering," printed in London in the same good style, are unnecessarily sticky. This arises from the absence in printing of some soft "pomade" to assist the colours in sinking. The other plate is a Nottingham print, entitled "Sea Horses." It is not sticky, and is both well drawn and printed. It may be done by the same firm in Nottingham that has printed *Father Christmas* and the *Penny Illustrated* plates, but it is superior to those plates in the absence of the strong underlying yellow. The "Sea Horses" plate is the most attractive, by reason of the pretty children so well drawn, with all the appearance of life-like fun.

The Lady's Pictorial certainly holds the second position with the large and charming plate, "Buttercups," after the picture by Louisa Starr Cauziani. It needs no comment. The subject, and its treatment by artist and printer, are excellent, and it is printed in London. The journal itself—printed by V. Brooks Day & Son—has a most attractive cover, and is full of thrilling tales, illustrated by blocks which contain, in themselves, sufficient to chill and curdle the blood on the warmest day, let alone at Christmas.

Pearson's Weekly should stand high in general estimation. The plate is but a bust of some enchanting lady—perhaps "Isobel" of "Home Notes" fame—copied in first-rate style from an

oil painting. The drawing and printing are excellent, and mounted upon linen it is fit for framing in imitation of an "oil." There may be room for criticism in the original drawing in some details, but the coyness of the face, with its "wicked" eyes, will cover a multitude of sins.

The Illustrated Sporting and Dramatic cannot fail to excite interest when it is known that the production has depended upon photographic means. The publishers say that it is entirely produced by photographic colour processes. This will be difficult to credit by those who have not seen the productions known as the Orell-Füssli chromo-collotypes. The plate has been produced at the Royal Art Institute, at Berlin, and gives one of the best examples of such photographic colour processes obtainable by the public.

To-day presents two plates. One of them is simply bursting with true humour —frequently enacted in real life; the other, "Phyllis," is a pretty lithograph.

The Penny Illustrated and *Father Christmas* have again issued fairly lively plates, entitled "Tally-ho!" and "Christmas Pudding," both printed in Nottingham.

Yule Tide seems to think the public wants quantity, regardless of quality. The principal plate of the seven—"Hide and Seek"—cannot be regarded by artists or printers as a success. Perhaps the least said about it the better, after the fine plates already noticed.

The Illustrated London News presents three plates, but "Bo-peep" is anything but attractive. It is passed over by many without the faintest remark of eulogy. The plate may be a fair copy of the original, but there is something so slow and untrue about the subject, that it does not appeal to the ordinary senses. The other plates are small, and were it not for the utter disgust on the dog's face in one of them, they would not claim more than very casual attention.

The Graphic has made a great effort in re-producing the portrait of the Princess of Wales—generally considered one of the crowning features of Luke Filde's portrait-painting career. The method of producing the large plate is not altogether clear. It bears the stamp of the chromo-phototype process; but it has apparently been assisted by lithography. It certainly cannot be claimed that it is a good copy of the picture, although it may be a masterly production by the process.

Black and White gives three plates. The coloured plate seems to be entirely chromo-phototype, and, as such, gives the usual low tone of colouring which has become characteristic of them. By a better selection of printing pigments, it might be possible to improve the plate. It is easy to see that, for the present at least, this photo method is not likely to take the place of chromo-lithography where cheap and good results are required. The other plates given are two long woodcuts—"Blossoms" and "Canaries," by the late Albert Moore—first-rate specimens of wood engraving, as well as good figure and drapery studies.

Horner's Penny Stories Christmas plate—"A Pair of Love-birds"—is produced by L. Van Leer & Co., in Holland. It possesses all the softness of Continental drawings, but the original is scarcely as well copied as it might be, and it is altogether too warm.

"Lady's Pictorial."

BUTTERCUPS.

Chatterbox has also had its plate produced in Holland. The picture entitled "A Ray of Hope," is however, to use a hard expression, too wooden.

Weldon's Journals' plates are all German prints. The plate of "Cats" is excellent, but the others are too smooth, especially the two children.

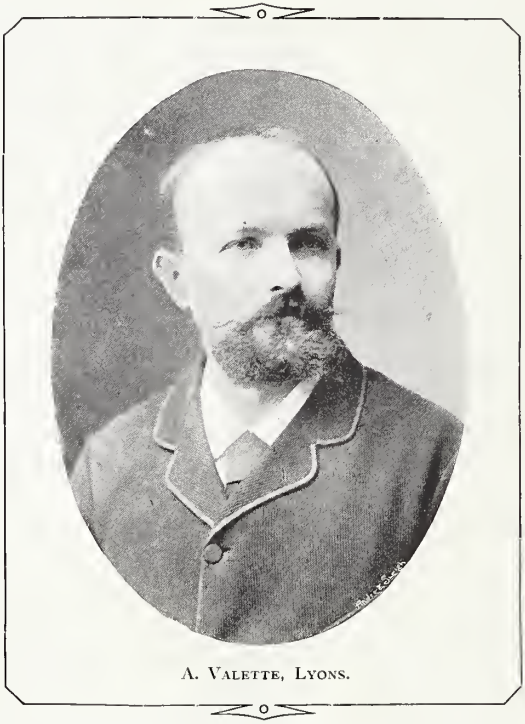
The Queen is this year accompanied by a plate —"A Reverie"—which seems to be a companion to the plate, "Reflections," already noticed. It is, however, a chromo-lithograph in sombre harmonies. The drawing and printing are very good, and the subject is by no means unattractive. A second plate is a portrait study in half-tone, and comes out as a moderate example of process work. The journal is up to its usual standard as a ladies' paper, full of bright, short stories, and all the items of dress and gossip so much favoured by the sex.

Pen and Pencil has certainly done its best to produce two excellent examples of the smooth, finely-stippled lithography characteristic of the Continent. The subjects appeal as lithographs only, and will be examined carefully by artists interested in stipple work.

The Gentlewoman has again had its Xmas supplement printed in colours upon satin. It is a study from that point alone. The "Gentlewomen of Pompeii" is printed in Germany, and the production on paper is very attractive. Both drawing and printing are excellent.

Tit-Bits and *Strand* have fully gauged the public taste when they determined to make the Christmas *Strand* a volume to be well remembered by its bulk and good readable matter, rather than by any more art supplements. The example thus set may be well followed by others, for there are not a few plates this year which act rather as foils to beauty, than as objects of beauty in themselves.

A PARCEL of every-day work from Mr. Peter Kieran (with Browne & Nolan, Dublin) contains some good examples of his ability as artist and engraver. Amongst the specimens are various commercial jobs, all neat and tasteful in design, the illustrative work being similarly pleasing in effect. Various advertisements of an Oriental character for an Arabian function away from home are truly Eastern in colouring and drawing, being bright yet appropriate, and striking in design.



A. VALETTE, LYONS.

Lithography in Lyons.

FROM M. Valette, who is already known to readers of the B.L. as a contributor to French and English trade journals, and as the author of the "Practical Manual of Lithography," we have received a set of wall cards and posters exhibited at the recent exhibition at Lyons. M. Valette was officially connected with the lithographic section of the exhibition, and entered into its duties with his usual energy.

The parcel includes a poster, 36 × 24-in., shewing a newsboy holding up the news placard of the *Lyons Républican*. In four workings — including red, pale blue, and buff — the poster is boldly and effectively designed, and printed most satisfactorily. The sheet bears the imprint of the litho printing section, Lyons exhibition.

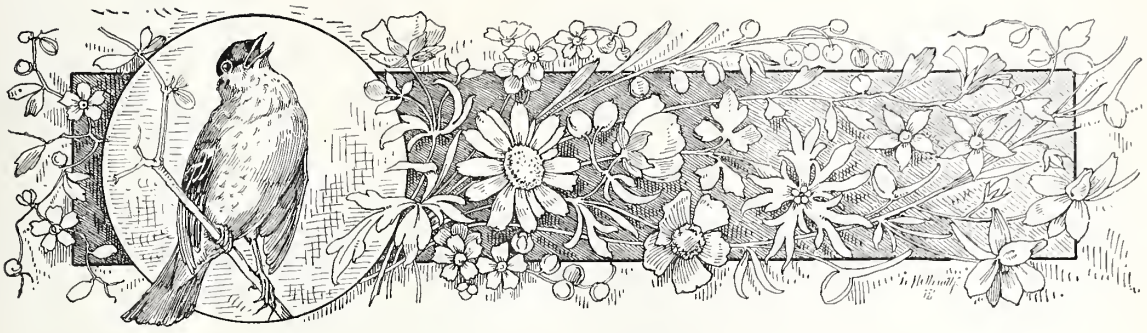
Amongst the large wall cards is one 26 × 20-in., shewing general samples of designs for note-heads, business cards, etc. The design, lettering, and general effect are of the highest standard, well illustrating the skill of our French confrères in commercial lithography. Another of the same size shews a series of fifteen views of Lyons, varying from carte de visite to 7 × 4-in., tastefully arranged and printed on a tinted ground. A third shews a series of views printed in black over a steel-grey tint, with stippled ground—models of good printing. A fourth is specially attractive; on sheet 26 × 27 are displayed various reductions from typo and photo-litho plates. There are three subjects, omitting the Senefelder vignette in the centre, and these are each shewn in four sizes, clear, proportionate, and evidencing the skilful attention of both artist and pressman.

We are pleased to present portrait of M. Valette with this notice.

[A large amount of matter, including "Photo-Litho Processes," has to be carried forward to next issue.]

DESIGN
for a FAN.

Printed by



Photographing for the Three-Colour Printing Process.

PHOTOGRAPHING colours and printing from photographs so obtained is no longer a delusion or dream; it is and has been an accomplished fact for a considerable time, but so far the results have been as the proverbial light hidden under a bushel, owing to the conflicting processes which have been used, and to no small extent to the petty jealousies of those working in the same channel, which have been the means of one expert decrying the methods of another, to the detriment of the advancement which each and all have been striving to make. For some ten years the process has been most clearly understood; and it has only required the perfecting of the means of production to bring it up to its present position. What its present position is, there are perhaps not many in the trade itself really know; because they have not seen many examples of the work, and in many cases they have not been sufficiently practical, or technically educated to thoroughly understand what they have seen. This must not be taken by any means as a slight; it is not intended so. That, however, has been the position, and it will probably be only those who are in possession of the latest information who will agree with this mode of stating the case. The actual printing trade has stood aloof, whilst photographers of the standard of Captain Abney, and practical workers such as Mr. Ives, have been working away and educating photographers, rather than educating the printing trade. Printers themselves are to blame for not studying the leading technical journals in photography, typography, and lithography; and for not encouraging in a genuine way the puny efforts of some of their staff to push forward and attain success. Then, again, where is the guild of printers to compare with the British associations of photographers? These latter have regular meetings, and see and hear all the latest improvements in any form of photography. It is to these associations that the leading photographers shew everything; whilst printers hoard up their trade secrets, and neither do themselves any good, nor impart any good to their fellows. Photographers do not call their monthly meetings technical classes, but in reality they are technical classes of the highest order, and one has but to go to a series of photographic exhibitions to see what technical education has done for photographers during the past ten or twelve years.

One of these interesting and instructive technical lectures was delivered some months ago to the Camera Club, in London, by Mr. F. E. Ives, and was devoted entirely to

COMPOSITE HELIOCHROMY OR THREE-COLOUR PRINTING,

and the following digest of the paper should prove of no small value to those who are yet in search of the details, because they have not full possession of the principles upon which the whole process is built up.

Nearly thirty years ago Collen (in England) and Ransonnet (in Austria) both published the idea that negatives might be taken of the red, yellow, and blue colours of any object, and by superposing transparent prints these should give a coloured photograph. Since the red-yellow-blue theory has been extinguished, such a process could not give the result, and it would be only by the use of a photochromoscope fitted to take red, green, and blue negatives at the same exposure, and ultimately by use of a similar lantern to throw these separately coloured pictures upon a screen so as to register, that a true naturally coloured photograph could be made; such a process being far superior to any printing method ever yet invented for combining such colour blocks to produce a finished print.

The original difficulty was to get the lower tones of colour—the less refrangible rays of light—to make a distinct negative. This was solved in 1873 by Dr. Vögel, who stained the sensitive films on

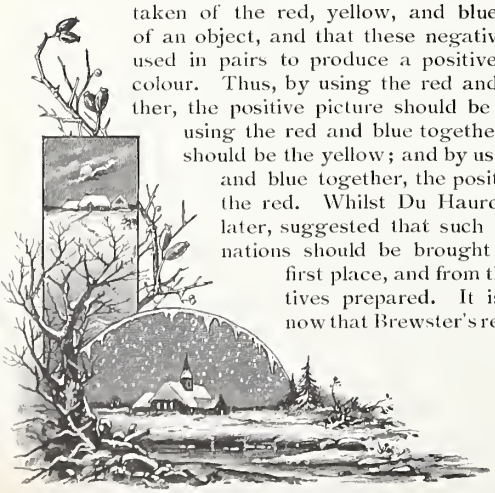
the photographic plates. This shews that over twenty years ago the primary difficulty was solved; but the present position has only been arrived at by a careful study and intelligent application of the modern theory of colour. It has been for want of this careful study of the present theory of colour that the first workers went astray upon false lines, and certainly produced some three-colour prints. The fact that prints were produced was satisfactory to those who were less informed, and the latter were easily brought to believe in the older three-colour processes, regardless of the fact that these prints were only a few selected specimens out of a large number of attempts. The most favourable conditions to obtain three-colour prints are to take three negatives upon colour sensitive plates, through colour selective screens. On this point it is interesting to go back and see what the first photographers who had the colour idea thought as to how to produce it. Thus, Collen suggested that negatives should be taken of the red, yellow, and blue colourations of an object, and that these negatives should be used in pairs to produce a positive of the other colour. Thus, by using the red and yellow together, the positive picture should be the blue; by using the red and blue together, the positive should be the yellow; and by using the yellow and blue together, the positive should be the red. Whilst Du Hauron, four years later, suggested that such binary combinations should be brought about in the first place, and from them the negatives prepared. It is well known now that Brewster's red-yellow-blue theory was a fallacy, and such processes could not succeed. Nevertheless, to shew the tenacity with which highly educated men will cling to old ideas, Léon Vidal still advocated the use of this theory up to as late as 1891.

F. E. IVES.

At a later date Du Hauron and Cros abandoned Brewster's theory of light, and agreed that negatives should be prepared from the orange, green, and violet colourations of an object; and Du Hauron exemplified this idea at Paris in 1892. But even these productions were crude and unsatisfactory, as might be expected from any process which ignores a considerable portion of the colour-rays of the spectrum.

Again, going back to 1885, the *Philadelphia Photographer* in that year (p. 303) sets forth Dr. Vögel's opinions on the new principles of heliochromy. He seemed to have an idea that although a picture might be obtained by the use of negatives for the red, yellow, green, and blue, that it would be often necessary to add other negatives for blue-green and malachite green, and possibly more. This expression of opinion seems to have been drawn from him, by the fact that the *Photographic News* of September 5th, 1884, gave a notice of Mr. Ives' own three-colour methods as practised as early as 1881, and brought prominently under public notice in 1885 at the Novelties Exhibition in Philadelphia, when a number of papers took notice of his process, and the matter began to obtain notoriety.

It was in 1888 that Mr. Ives argued that by a thorough application of the density curves from Maxwell's diagrams, to the making of accurate colour-selective-screens, it was quite possible to



prepare photographs of any coloured object by three negatives only. This has been rendered still easier by the publication in the present year (1894) of "The Photochromoscope," containing many of the most valuable investigations of Captain Abney and others. And since 1890 he has pointed out that any method of bringing such colour photographs down to printing methods, must result in a degradation of the object by lack of natural brilliancy.

As might be expected, Mr. Ives' methods have not been openly accepted by anyone. They have been ignored. Yet he maintains their superiority, in every respect, over any other method.

Coming closely to the crucial questions or points in the methods, Mr. Ives gives the following methods for preparing the colour negatives.

TO PRODUCE THE NEGATIVE OF THE RED-COLOUR SENSATION, he says:—Use extra rapid gelatino-bromide plates, which have been well dusted and have had flowed upon the surface a filtered quarter-grain solution of cyanine in absolute alcohol. This is drained off, the plate dried, then immersed in water for a few seconds, and whilst still wet exposed in the camera; the exposure being made through a compound screen of dense yellow and medium light chrysoidine orange.

TO PRODUCE THE NEGATIVE OF THE GREEN-COLOUR SENSATION.—Use Edwards' instantaneous isochromatic plates, exposed through a screen of rather deep brilliant yellow.

TO PRODUCE THE NEGATIVE OF THE BLUE-COLOUR SENSATION.—Use an ordinary instantaneous gelatino-bromide plate, exposed through a screen of a very light shade of chromium green (not "signal green") glass, optically worked for the purpose.

These are the methods to be employed when working with an ordinary camera, and taking the three negatives successively. But if it be possible to use a photochromoscope, then expose Edwards' instantaneous isochromatic plates through the following screens, viz.: for the red negative, a compound screen of very deep brilliant yellow and medium magenta (fuchsine); green negative, a screen of a deep brilliant yellow; blue-violet negative, a screen of light chromium glass, with a screen of aniline violet, dense enough to exclude yellow-green.

Such an epitome of the preparing of screens and plates seems to render the matter comparatively easy; but for really accurate work these screens should be prepared and adjusted by photographing the solar spectrum, then altering the proportion of the colours in the screens until the density curves in the spectrum closely agree with the graphic curves in Maxwell's diagrams, corrected according to the latest discoveries of Captain Abney. This precision in preparation is no fad; it is necessary, for a five per cent. error in the magenta in the yellow screen is fatal to its accuracy. Mr. Ives himself works with screens which are slightly more complex than the two sets described above. For instance, the yellow screen may be improved by a small addition of thio-blue A.

From the immense pains which Mr. Ives has taken to prepare his methods, he deplores that there should be men, who have received all their tuition under him, ready to pretend that they have improved upon his plans, and thereby obtain a cheap notoriety, and humbug journalists to give notices of their discoveries.

He suggests as his reasons for using rapid plates that they give *(a)* short exposures, *(b)* truest rendering of light and shade. And owing to the difficulty of getting three successive photographs accurately, he believes it will become necessary to use a triple camera so that all three may be taken at once.

The next great difficulty in the process is the proper selection of the pigments to be used to print these three-colour blocks with. The old adherents of Brewster's theory suggest red, yellow, and blue inks. Others suggest that the pigments should be the complementary to the colours of the colour-selective screens themselves. Whilst Dr. Vögel suggested that the colours of the pigments should be spectroscopically identical with the colour-sensitisers used in obtaining the negatives. Taking these ideas in order, the first must be wrong, because pure primary colour pigments do not give the secondary colour combinations known as green or purple. The second idea cannot possibly be correct, because the complementary colour pigments to the colours of the first set of screens, described above, would be greenish-blue, deep blue, and purple; whilst the complementary colour pigments to the second set of screens would be light cyan-blue, deep blue, and orange yellow. From inspection, it is plain that a print produced from one set of these pigments could not appear the same as a print from the other set. The third idea, that of Dr. Vögel, would require that the pigments should be cyanine blue, eosine pink, and pale yellow; but practice has proved that these are quite inadequate to produce the naturally coloured three-colour print.

The principle of selecting the pigments should not be based upon the methods or colours of the screens, but they must be in direct opposition to the colour represented by the negative. This can be readily understood, when it is calculated that the red negative will produce a positive of all the parts of the object which did not reflect a trace of

red colouration. Therefore, the pigment must be such as to absorb all the rays of white light which contain red, and reflect only those totally devoid of red.

Therefore, the following must be the pigments used :—

For the block from the red negative—Prussian blue, slightly acidified with sulphuric acid. Or the dye "thio-blue A."
For the block from the green negative—Mixture of eosine and rhodamine pink.
For the block from blue-violet negative—Brilliant yellow.

To test the accuracy of these colours it is easy to wash them upon gelatine films and superpose them, when they will be found to give every desirable effect.

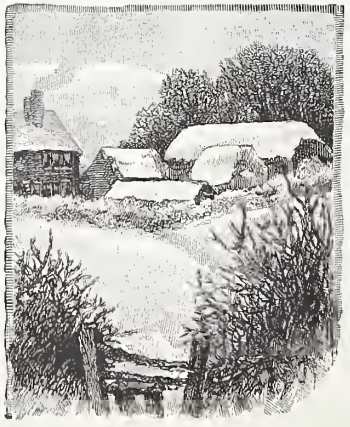
It should not be overlooked that the positives must be the best obtainable from the negatives. And it is only to be expected that window transparencies and lantern slides will be the best examples of the three-colour method, because there is in both cases a brilliancy added to assist in its more natural effect.

Prints produced by these means were shewn by Mr. Ives at Philadelphia in 1890, a full description of which was given in the *Philadelphia Ledger,* December 20th, 1890. One of these prints was from a chromo-lithograph. These same prints were commented upon in the *Boston Herald*, and he believes that had he then brought them to Europe and exhibited them in London, Berlin, and Vienna, it would have saved a great waste of energy which has been drifting into a wrong channel. Even though he had attained to such an apparently high level in the process, yet he let it lapse after the above effort until he perfected the photochromoscope. And at this present lecture the samples of composite heliochromy were prepared from photochromoscope negatives. They were prepared by using bichromated gelatine films upon clear celluloid, exposed to electric light, under negatives, from the back, and developed as carbon prints. These carbon prints of the colours were dipped in dyeing solutions suitable to the correct printing colour. These dyeing solutions must be very accurately prepared. In this way, first-class lantern slides, coloured "naturally," can be produced in a day ; whilst with greater mechanical developments and precision the dyeing operation could be done with continuous certainty, and lantern slides produced equal to and cheaper than the best hand-painted ones.

The ideal process for such work is Woodburytype. Mr. Ives submits that his prints are in all respects equal to the half-dozen most successful Lipmann colour photographs selected for exhibition from numerous imperfect results. The colours, too, are probably truer to nature than the best of Lumiere-Lipmann's, whilst the area of the products can be eighty to one hundred times larger than theirs. The method he argues is simply a carefully reasoned-out application of the laws of nature, and not a discovery ; the accuracy of the results being due to calculation and measurement, rather than to experiment. And if it were possible to produce equally good results by machine printing, upon paper, then it would supersede all the other colour printing processes ; but with the present imperfection in machinery, impure inks, faulty paper, broken shading, and bad ink distribution, the average prints of a large edition can only be considered a disappointment.

Collotype printing should be the best for the purpose, but its inherent difficulties have almost thrown it out of use. The films are so weak that in the preparation of the colour, and in obtaining the proper position of register, so many prints have to be taken, that the film is almost destroyed before the actual printing commences. Hand-inking and collotype are out of the question, except for a few specimens which might be produced by selecting about one out of every twenty prints. He points out that there has been great reluctance in shewing the originals side by side with the three-colour prints, and he shewed in 1892, before the Royal Institution, the difficulties which stand in the way of machine-printing these three-colour productions. But Dr. Vögel asserted that a German printer, Ulrich, was able to produce any number of good prints ; yet the past two years have not brought forth any tangible proof of this position. Again, Baron Hübl, with all the advantages at his disposal of the Military Geographical Institution of Vienna, followed out Dr. Vögel's teaching as carefully as he could interpret it, yet he came to the conclusion that every impression must be absolutely identical in colour and intensity before an edition of such prints can be used, the slightest irregularity in either colour making all the finished prints so markedly different as to render them unfit for use.

Collotype as practised for the Orell-Füssli photo-colour prints at Zurich, in which any number of colours are used, as required, has been made commercially successful for colour work. But the most successful method of three-colour printing by machinery is that devised by Mr. Ives, in 1881, by using single line blocks for each colour, and crossing the lines in the printing process so as to get a superposition of colours and the consequent secondary effects. Those prints were not then noticed, but the same identical prints made much notoriety in 1884-85. He does not claim they are



by any means perfect, but that it is the best machine-printing method for the process.

He is fully aware that coloured surfaces should be continuous films, such as obtainable in collotype, but that is impossible in type printing, and the best compromise for the continuous surface is the crossing of lines of colour which can be done in typography. An experiment readily proves that if the colours be worked out in single lines, and prints produced by superposing these lines at angles to each other, and by also printing them parallel to each other, the two prints would be vastly different.

These colour blocks are produced by the use of cross-line screens in the camera, and by exposing the plates at the same time through the colour-selective screens already described. Mr. Ives believes he was the first maker of cross-line screens in 1886, and he has proved that it is as easy to make a single-line block from a cross-line screen, as from a single-line screen; whilst Kurtz and Vögel, in ignorance of this, patented the use of single-line screens "without turning." The real explanation of this peculiar power of the cross-line screen lies in its function as a cross-line screen to produce minute pin hole images of the aperture in the diaphragm upon the sensitive plate. At a certain distance between the screen and the plate, the screen will produce the image of any shape of aperture in the diaphragm that may be desired. Therefore, if an aperture be made in the diaphragm at such an angle as to be parallel with one set of the lines of the cross-line screen, and of a certain width, the images of such aperture upon the sensitive plate will so overlap one another as to obliterate the contrary lines on the screen. By adjusting the length and width of the aperture in the diaphragm, *i.e.*, by having a set of diaphragms with different sized apertures, it is possible to obtain the following results:—

(a) Negatives in a single smoothly graduated line.
(b) Negatives with a single line continuous through the middle shades, and dotted off into the lighter shades.
(c) Negatives with a cross-line tint, in which one series of lines is more pronounced than the other.

In any case, the negatives for the three colours should be produced at the same time by the photo-chromoscope, and they should be printed upon the sensitised zinc at the same time, taking care that the direction of the lines has been set correctly to give the necessary angle in crossing. Such arrangement reduces the photographic operations from twelve to four, and should assist in making the process commercially successful. It should not be forgotten that single-line blocks do not give as good results as cross-line blocks; but they certainly give a semblance to nature which it is almost impossible to obtain by any other chromo printing process.

Notwithstanding all that has been done to facilitate the process, more than one company has failed to produce successful commercial results. That which the New York Collotype Company and two important companies in England have failed to do under the instruction of Vögel, Kurtz, and Husnik, may yet be done. But neither will it be done so easily nor so completely as claimed by some who were ignorant of its difficulties, or by others who have alleged secrets and patent rights, as to possess any great practical advantages over the older processes of chromo printing.

The photochromoscope represents the highest development of composite heliochromy. Other processes involve complications, compromises, and difficulties culminating in the three-colour block process, which, though crude, will turn out the largest number of average good prints at the lowest cost. Notwithstanding all that he has said in favour of this three-colour block process, yet as a practical printer, photographer, and process block maker he discourages everyone from pursuing the process, as it fails to give high-class prints in printing offices as now equipped for the purpose.

In conclusion, he points out that the very best methods of three-colour printing are public property in Great Britain, not guarded by patent or secrecy. Their proper utilisation requires that printing press builders, ink makers, and pressmen should make as great improvements in colour-printing machinery, inks, and methods, as have been made in machinery, paper, and methods for half-tone block printing since he introduced it some thirteen years ago, to bring about the possibilities of the typographic production of three-colour prints in large editions which shall be almost, if not quite, a commercial and high-class success.

* * * * *

Struggling with the Tins.*

Ah me! the press is ready, and the bang upon the wall
Is not a big explosion, but the oft-repeated call
For the tin girls to assemble, sheets of tin to haul and lift,
And never into laziness allow themselves to drift.

From the press up to the garret, and then into the trays,
Then back and forth, then up again, for many, many days;
Our hands are scratched and bleeding, our minds are not content,
Our clothes are grimy, dusty, and oftentimes are rent.

Beneath smiling faces and snatches of "Daisy Bell,"
We are wishing, always wishing, that the tins were all in—well,
It must be God's good will that we should expiate our sins
By working on the Litho side, a-struggling with the tins.

And when the tins are dry we from the trays do take them,
And pile them up and count them, or maybe we do bake them,
And from the bad ones wash the ink with rag and turpentine,
While our dirty little fingers are burning all the time.

And when the day is over and we are tired and dreary,
Those words do slowly form themselves within our brains, so weary:
"It must be God's good will that we should expiate our sins
By working on the Litho side, a-struggling with the tins."

MOLLIE E. FITZGERALD, *in The American Pressman.*

* Written while working on the lithographic side of a great printing office in San Francisco, printing sheets of tin for lard pails.

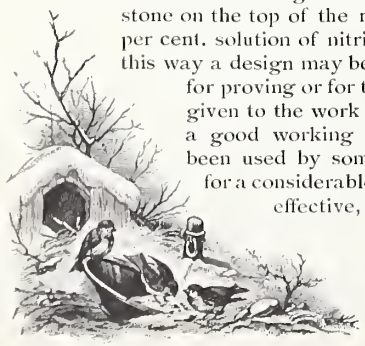
BY CHARLES HARRAP.

CHAPTER XVII.

ROLLING UP AND PROVING TRANSFERS AND DRAWINGS.

At the conclusion of chapter XVI. was given a general method for rolling up any transfers or drawings upon polished stone. But there are some improved methods which have been brought out in recent years, and have proved very effectual, which deserve more than a passing notice.

In a paragraph published some four years ago in the *American Lithographer and Printer,* the following "excellent method" of rolling up was fully described. The stone having been gummed up, is washed and gummed up a second time with a very thin solution of gum. Prepare solutions of lithographic chalk scrapings in turpentine, and a solution of lithographic asphaltum in turpentine. Mix equal quantities of both and keep it in a bottle ready for use. Instead of proceeding in the usual way to wash off the gum, allow the thin film of gum to remain on the stone and wash out the work only, with the above mixture of chalk and asphaltum in turpentine. This does not disturb the gum, but it materially strengthens the grease of the work. Having allowed the stone to dry by evaporation, next roll the whole stone up solid in a good strong printing ink. When it is solid, then sprinkle it with water, spread the water evenly over its surface and it will dissolve the gum. Clean up the stone with a sponge as far as possible, and finally roll up the stone to bring away any remaining portions of ink and gum. Afterwards, dust well with resin, and etch with a one per cent. solution of nitric acid in gum water. Again roll up the stone on the top of the resin, and etch with a two per cent. solution of nitric acid in gum water. In this way a design may be very effectually prepared for proving or for the machine, and the relief given to the work will be sufficient to insure a good working stone. The process has been used by some printers in this country for a considerable time, and has proved very effective, especially for fine work.



Upon the same lines, a new material has been introduced into the trade, under the name of "Lithophile," which is spread upon newly transferred work in exactly the same way as the mixture of the chalk and asphaltum solutions. But, before so applying it, the work is lightly washed out with good turpentine upon the dry gum layer. This product has been used with very great success during the two or three years it has been upon the market, and seems to supply one of the materials which has long been wanted in the trade. Special details of Lithophile were published on pp. 7, 8 of THE BRITISH LITHOGRAPHER, vol. II.

Still leading towards improvements in the same direction, E. Trochard has introduced an etching ink, under the name of *"Noir à monter en relief."* This ink seems to be a greasy dubbin-like material, which, owing to its hardness, has to be incorporated in as large a proportion as possible with a printing ink, and then the work is rolled up with it. Being a strong, hard ink, the work requires carefully and fully rolling up, and the result is that the work does not get overloaded with the ink. After rolling up, the stone may be etched with a strong acid solution, and when washed out and finally rolled up, it presents a very fine appearance.

Either of these methods may be used as the first part of the process of preparing the stone for printing from. But it is apparent that the stone will require all the usual preliminaries of cleaning the edges, taking out odd specks, and sharpening the lines with the water-of-Ayr stone, acid stump, and scraper, before the work can be printed. All repairs or corrections must be done before the final etching is given to obtain a certain amount of relief for the work. These several processes are generally followed by a very weak etch, given to the stone by rapidly washing its surface with a weak acid and water solution in a sponge, followed immediately by gumming the stone. The gumming is completed and the stone allowed to dry. Then should follow the etching proper by Trochard's ink, or other methods, to give the work a slight relief. For some years the practice of obtaining relief fell into disuse, and it was only about ten years ago that it was revived and practised to a larger extent. The advantages of relief are obvious. When the work has once been made complete, and has been etched into relief, it is clear that in printing the paper will only take the ink from the portions in relief, thereby giving a sharp, clean print. This tends to give the work a long existence, which can be still further lengthened by an occasional etch during the course of a long run. But if the relief is too great, then the blanket, the inkers, and dampers become impressed by the work, and ultimately the ink creeps down the work in relief, the paper being also forced down by the impression in the blanket, and

the work becomes thickened or feathered, whilst thin papers crease and run the risk of being torn. This is only the case in high relief, and such apparent disadvantages should not deter the printer from always bringing the work into a fair state of relief.

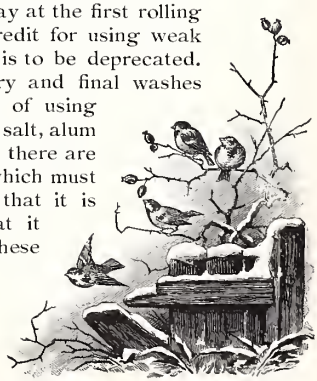
Other than by the use of Trochard's ink, there are several old-standing methods of obtaining this relief which cannot be omitted. One of the commonest methods is that known as a resin etch, which was partially described in the earlier chapters. In this method the work is well rolled up, so as to give a body of ink which will take hold of a quantity of finely-powdered resin, dusted over it. After which the resin is incorporated with the ink hy being exposed to an open fire; or by flooding the stone with a thin layer of methylated spirit, which is then ignited; or by using a "burning lamp" which forces a flame from burning spirit down upon the stone; or by placing on or near the surface of the stone a blanket soaked in benzine. The latter must never be used near any source of heat, or it will ignite and become too powerful to master. The resin and ink having become incorporated, the stone may be etched with strong nitric acid to the desirable extent. But if this process is used, it is advisable to finish dusting the stone with talc or French chalk. This is recommended because of its extreme fineness and its greater adaptability to "cover" every portion of the finest work, whilst the particles of resin may be too large to be most effectual. The resin itself may be substituted by fine asphaltum powder. This is a common method, but the fact of having to roll up the work so full causes the work to be really thicker than was originally intended. Therefore Trochard's ink is superior to that process. Another method, however, is to roll the work up in the ordinary way, and dust it with French chalk or talc only. In this case the work can be kept fine, and the talc is an absolute resist to nitric acid. It will not decompose in the acid; and, being so fine, it covers every portion of the work which has been rolled up.

This, however, is not the case with a very commonly used fictitious resist, in the form of ordinary bronze dust. By putting nitric acid upon bronze, the latter is at once decomposed. Fumes of various oxygen compounds of nitrogen are given off, and the metal is destroyed. Any excess of nitric acid immediately attacks the work and destroys it.

After any of these etches the stone must be gummed up. When dry, it should be washed out with turpentine to get rid of any of the resists, and finally rolled up for printing. It should be well gummed, and allowed to stand some time before being proved or printed from.

The final rolling up for proving and printing requires considerable care and tempering. Should the work appear weak, then it must be repaired by the artist, or it may be remedied by warming the stone at an open fire. After it has been warmed, it should be cooled and gummed up. The rolling up must be done with a soft ink, until the work has been thoroughly brought back. Weak work may be greatly assisted by washing it out with a strong solution of stearine in turpentine; or a mixture of olive oil, or palm oil, and turpentine. Or it may sometimes be effectually strengthened by rolling it up with a thin ink and allowing it to stand awhile. Whenever weak work is being assisted by heat, it is necessary to gum up all those parts which may be considered good enough, before placing the stone before the fire.

Should it be found necessary to have weak work repaired by the artist, there is a time when it can be done most easily. Such a time occurs immediately after transferring, when the paper and composition have been thoroughly removed and the stone well washed with hot water. At that stage gum has not been applied to the stone, and it is very easy to ensure the stone being clean by simply washing with hot water. If, however, the weakness of the work is not discovered until it has been rolled up, then the stone requires exceptionally well cleaning to remove all traces of gum from its surface. The methods for doing this vary very much, and each method has its own advocates. The methods of cleaning are:—First to thoroughly soak and wash the stone in cold water, followed by a soaking and washing with hot water. The next wash may be given with citric acid, or better still nitric acid, either being in a very weak condition. The nitric acid will remove all gum, and the citric acid may be capable of removing almost all the gum. In both cases the acids bite clean, and can be thoroughly washed off the stone. After well washing in cold or warm water, the stone is ready to be worked upon. Secondly, the same preliminary stages, and the final wash may be given; but instead of nitric or citric acid, some printers prefer acetic acid. If this be used in a very weak solution, there is not so much danger as with a fairly strong solution. The latter frequently dries or sets in or on the stone, as a film, which is not perceptible until the artist begins to work upon it. Then the ink curdles from the brush or pen, and broken lines are the result. If, however, the artist succeeds in making an apparently firm line upon this film, the whole of the repairing work is torn away at the first rolling up, and the artist gets discredit for using weak ink. The use of acetic acid is to be deprecated. Thirdly, the same preliminary and final washes may be applied, but instead of using the acids named, the so-called salt, alum may be used. In using alum, there are two features of its reaction which must not be overlooked, namely, that it is acid in its reaction, and that it is a solvent of grease. These



features have a certain recommendation, and the knowledge of them is a safeguard to its use. Whenever used, it must be in the weakest possible solution. A strong solution dissolves the grease of the work, which, if rolled up heavily in a good ink, will spread upon the stone ; and if left upon the stone, will destroy added work in the same way as an acid. But used very weakly, its acidity cleanses the stone, whilst its power to dissolve grease actually assists in carrying the grease of the repairing ink down into the stone wherever it is employed. Fourthly, after thoroughly washing and soaking the stone in hot and cold water, it may be rolled up, dusted with French chalk, slightly etched with very weak nitric acid, well washed, and it is ready to repair upon.

These four methods are sufficiently exhaustive to ensure that one or other of them will give the desired result. Sometimes by accident, such as the washing or damping of the stone with an acid sponge instead of a water sponge, the mischief is so extensive and apparently so drastic, that it seems better to prepare a new stone, than to attempt to patch it up by repairs. Before going to such an extreme, there is a method which can be highly recommended for saving work so injured. It should be remembered that however brief may be the time that grease has been upon a litho stone, that grease has formed a compound not only upon the surface, but it has penetrated to a slight extent below the surface, and the longer it remains upon the stone, the deeper does it go into the stone, forming the same compound, which is insoluble in water. Therefore, when an accidental wash with an acid sponge has been made, such á wash only bites the surface of the stone, and apparently deadens the grease. To remedy this the stone must be washed at once, and then with a flat piece of water-of-Ayr stone the parts which have been attacked by the acid must be steadily and lightly polished to remove the deadened surface. When that is done, it can be rolled up with a good greasy ink, and the spoiled work restored. The longer the work has been on the stone, the deeper it may be polished, with the same result that it will always take ink again.

Again, there are times when accidental scratches are made in a stone across the work. Sometimes this can be remedied by polishing the stone down around the scratch, and either rubbing it up as above, or by the artist repairing the work. This, however, is not always possible. A method which has proved successful as a temporary means, is to scratch the scratches clean, and fill them with resin dust. Melt the resin in by heat, level it off, and repair the work on the top of the resin. Another somewhat similar, but more permanent, method is to scratch the scratches clean, and fill them with a solution of bichromated gelatine, as prepared for photo-lithographic transfer papers. This must be levelled, and can then be drawn upon. The very nature of these methods demands that considerable care must be subsequently used. Difficulties and disappointments may happen, but in the majority of cases it will be found the most expedient method of repairing accidents of that character.

The remaining items in the rolling up and proving, are the use of the correct ink for the state of the weather and for the work ; as well as all the little knacks of handling the materials that can only come by a long and painstaking experience. On the question of ink, however, but a few remarks are required. In hot weather the grease of the ink is much softer than in cold weather, and requires to be tempered with a stronger varnish. In cold weather, on the contrary, the ink requires tempering with thinner varnish. But so much depends upon the nature of the work, and the paper to be used, that no hard or fast line can be drawn as to the exact consistency of any ink to be used.

* * * * *

The Caxton Convalescent Home.

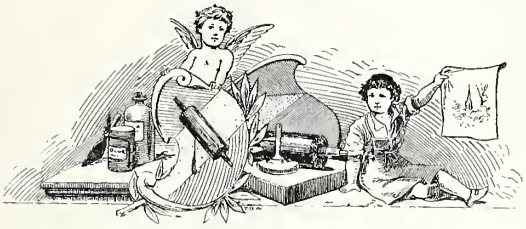
LIMPSFIELD, Surrey, was *en fête* on Saturday afternoon, October 6th, the occasion being the laying of the foundation stone of the New Caxton Convalescent Home. The ceremony was performed by the Lord Mayor of London, who was accompanied by the Lady Mayoress, Mr. J. Passmore Edwards, Mr. C. J. Drummond, Mr. C. Bowerman, Mr. R. Minter, and other gentlemen constituting the acting managers of the Home, and a large number of friends associated with the printing and allied trades.

Mr. Minter, as chairman of the Working Committee, read an address to the Lord Mayor, in which he described the history of the movement, the necessity for such a home, and the various steps already taken. The liberality of Mr. J. Passmore Edwards, whose noble philanthropy had made the step possible, was also feelingly acknowledged. The Lord Mayor expressed the special interest which he felt in the occasion, and congratulated the pioneers of the movement on the success they had already attained. Mr. J. Passmore Edwards acknowledged the thanks tendered to him, and expressed his pleasure in being able to assist in the work. Messrs. Drummond and Bowerman also spoke, and tendered thanks to the Lord Mayor and Mr. Edwards for their presence and assistance. Messrs. De La Rue's band was in attendance, and played various selections of music prior to and following the laying of the stone.

The whole ceremony proved of a most interesting and cordial nature, and the earnest pioneers, who have carried the project thus far, well merit the thanks of the entire trade.

W. R. ROYLE & SON in presenting the above Specimen of their Designing and Engraving, beg to state that they are the oldest established Trade Steel and Copperplate Engravers and Printers in the City of London.

Their long practical experience ensures that all orders entrusted to their care will be executed in the very best possible manner, and at the most moderate prices. They are up to date in every department, and expedition, the great necessity of the age, is carefully studied. They will be happy to promptly furnish designs and estimates for every description of Steel and Copperplate work.



Lithographic Chemistry.

It is pointed out by Charles Verneuil, in *L'Imprimerie,* that although it may appear unnecessary to reiterate primary facts appertaining to lithographic chemistry to those who are experienced in trade procedure, yet without some constant reference many of the special terms used lose their full significance and become mere words, unless their full origin and meaning are thoroughly grasped. In an abridged form, we thus mention some of the general features of liquids, gases, and materials frequently used in lithography.

Acids.—Chemical compounds which combine with bases to form salts. Most of them are composed of oxygen and some other simple body, which gives them their name.

Nitric acid.—Acid from saltpetre; azotic acid.

Azotic acid.—Acid from azote; acid from saltpetre. The concentrated azotic acid weighs 1 kilogram 510 grams per litre, and shews 48 degrees on the Baumé acid scale. The ordinary acid of commerce weighs 1 kilogram 390 grams per litre, and shews 40 degrees. The weak acid weighs 1 kilogram 338 grams, and shews 36 degrees.

Acetic acid.—Acid from vinegar.

Carbonic acid.—Acid from carbon.

Citric acid.—Acid from lemon.

Hydrochloric acid.—Acid formed from chlorin and hydrogen. Experimental study shews the singular action of chlorin upon certain matter, the hydrogen of which it extracts to take its place. Concentrated hydrochloric acid weighs 1 kilogram 210 grams per litre, and shews 25 degrees by the acid scale (or gauge). The ordinary article weighs 1 kilogram 170 grams, and shews 21 degrees.

Malic acid—Acid from the juice of an apple.

Oxalic acid.—Acid from the juice of the sorrel.

Sulphuric acid.—Acid from sulphur. Concentrated sulphuric acid weighs 1 kilogram 842 grams per litre, and shews 66 degrees on the areometer. The ordinary acid weighs 1 kilogram 838 grams, and shews 65 degrees. Weak acid weighs 1 kilogram 700 grams, and gives 60 degrees.

The attention of the Society for the Encouragement of National Industry has been called to a singular property of melted sulphur by M. Lepierre. If this body is poured while in a state of fusion over a sheet of paper on which letters, etc., are printed or traced with ink or pencil, the sulphur will take up the colouring matter, and after cooling down, will present a reversed proof of the image which was on the paper.

Phosphoric acid.—Acid from phosphorus.

Phosphates.—Salts from phosphoric acid; for instance, phosphate of lime, composed of phosphoric acid and lime; phosphate of iron, composed of phosphoric acid and oxide of iron, etc.

Phosphorus.—Simple or elementary body, entering into the composition of bones, urine, and nervous matter.

Tartaric acid.—Acid from tartar, matter derived from the dregs of wine.

Silicic acid.—Acid from silex, matter derived from flint.

Alkalies.—Bases which turn the violet syrup green, or red vegetable liquor blue, such as potash, soda, ammonia, etc.

Alkaline earths.—Name commonly given to lime, to baryta (a chemical base akin to lime) and to magnesia.

Alkaloids.—Organic alkalies, such as quinine, morphine, nicotine, etc.

Sodium.—Metal contained in soda, and entering into the composition of common or kitchen salt.

Soda.—Alkali formed from sodium and oxygen, base of the ordinary soap. The concentrated lye of soda weighs 1 kilogram 332 grams per litre, and shews 36 degrees on the acid scale. Highly concentrated soda lye weighs 1 kilogram 380 grams, and shews 49 degrees.

Chloride of potash and chloride of soda.—The hypochloride of potash is known in the market under the name of Javel's water, and the hypochloride of soda under that of Labarraque's water. Both are used to bleach textile fabrics, papers, and also as disinfectants.

Their manufacture is very simple. Dissolve 200 grams of crystallised carbonate of soda, or 120 grams of American potash, in 1,500 grams of hot water. Dilute in another vessel 100 grams of chloride of lime in two litres of water; filter; wash the residuum on the filter with a litre of water, pouring it in parts at different times; then mix the two solutions, the potash or soda with the chloride. Stir the mixture with a glass or wooden spatula; allow it to rest and decant. The deposit is formed by the carbonate of lime resulting from the chemical reaction.

Alcohol.—Absolute alcohol weighs 794 grams per litre, and marks 100 degrees on the centesimal areometer. The 40 degrees alcohol, so called, weighs 814 grams, and shews 95 degrees. The 36 degrees alcohol weighs 851 grams, and marks 85 degrees.

Ether.—Sulphuric ether weighs 729 grams per litre, and marks 66 degrees on the Baumé's areometer (alcohol weigher). The ordinary article weighs 658 grams, and shews 56 degrees.

Turpentine.—The spirits of turpentine (turps) weigh 869 grams per litre, and mark 32 degrees on the alcohol weigher.

Counterfeited spirits of turpentine are manufactured from oil of camphor and petroleum. This product smells like the spirits of turpentine, its density is little different, and its chemical composition is a little more identical. It may replace the spirits of turpentine in all its uses in printing; only it is rather less inflammable.

Mineral essence.—This essence weighs 705 grams per litre, and marks 70 degrees on alcohol weigher.

Petroleum.—Rectified petroleum weighs 795 grams per litre, and marks 47 degrees on the alcohol weigher.

Benzine.—Benzine weighs 890 grams per litre, and shews 35 degrees on the alcohol weigher.

Glycerine.—Concentrated glycerine weighs 1 kilogram 260 grams per litre, and marks 30 degrees on the acid weigher. Officinal glycerine weighs 1 kilogram 240 grams, and shews 28 degrees.

A chemically pure glycerine is an oily liquid, slightly sticky, colourless and inodorous, very sweet to the taste and never crystallises. Its most important properties consist in its own solution, and in its capacity to dissolve other matters. It resists freezing, even at very low degrees of temperature. Glycerine is also very useful as a means of preservation. It can be obtained only by repeated distillation, and when chemically pure never changes.

Glycerine is easily mixed with other liquids, such as water, alcohol, chloroform, etc.; by thickening them it raises their degree of congealment; that is to say, renders them less liable to congeal. As a solvent it has many different uses, as, for instance, to dissolve potash, soda, oxide of lead, as well as most of the metallic salts soluble in water; several metalloids, such as sulphur, phosphorus, iodine; vegetable acids, alkaloids; extracts and juices, and finally for many colouring principles.

A dangerous modern invention, nitro-glycerine, has given the impression that simple chemical glycerine had the same explosive property; it is as if we attributed this property to linseed oil.

The chemical combination of glycerine with sulphuric acid and saltpetre produces a very different substance, nitro-glycerine, which is a violent poison, develops a tremendous force, and is very explosive; hence nobody will think of using it in a printing office.

Naphtha.—Weighs 837 grams per litre, and marks 38 degrees on the alcohol weigher.

Methylene, or spirits of wood.—Weighs 798 grams per litre, and shews 47 degrees on the alcohol weigher.

Schist.—This oil weighs 830 grams per litre, and marks 39 degrees on the alcohol weigher.

Linseed oil, "réseille."—Weighs 935 grams per litre, and marks 20 degrees on Baumé's alcohol weigher.

Glucose.—This syrup weighs 1 kilogram 394 grams per litre, and marks 33 degrees on the acid weigher.

The data given are determined at a temperature of 15 degrees to 16 degrees C.

Oxygen.—A gaseous body which forms part of the air, into the composition of which it enters in proportion of one to five, so that the other four-fifths are filled by another simple or elementary body called ozote or nitrogen.

Oxygen is the respirable part of the air; it is the part that makes wood, coal, etc., burn; so that no animal can live and no combustion take place where there is not a sufficient quantity of oxygen present. This gas has a great tendency to combine chemically with almost every other body, as has been seen.

When metals become rusty in the air it is because they combine with the oxygen; therefore, oxygen can be extracted from iron rust, or from the verdigris, which is the rust of copper.

Plumbago.—This is the matter used to manufacture lead-pencils, so called, although it does not contain any lead, being a substance composed of iron and carbon.

Simple or elementary bodies.—Sulphur, gold, silver, iron, lead, mercury, and all the metals in general are simple bodies.

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What the Artists are doing in the United States.

THE fifth annual convention of the International Lithographic Artists' and Engravers' Insurance and Protective Association, which was held at Bastendorf's Hall, Detroit, Mich., began its sessions on Monday, August 27th last, and adjourned August 30th.

The convention was pronounced a decided success. The different subordinate associations were represented by intelligent and progressive men. The principal business was the final arrangement for carrying into effect the insurance feature recently added to the charter of the General Association. The reduction in salaries, the apprentice question, the proposed school of lithography, piece work and team work, salary schedules in different parts of the country, arbitration, and last, but not least, the tariff on lithographic goods, were fully discussed.

It was decided to have circulars issued to all lithographing houses in the United States, informing employers that by opening correspondence with the recording secretary of the S.A. nearest their locality, they could engage reliable and efficient artists and engravers. The financial condition of the General Association was reported as very good, taking into consideration the depressing state of trade during the last year. An increase of 121 members during the last year was reported. Philadelphia was selected for the next convention.

What is Colour?

CHAPTER XIII.

EFFECT OF NORMAL AND ARTIFICIAL LIGHT ON COLOURS.

IN the foregoing chapter a large number of diagrams have been given to assist artists in making the best possible use of a limited number of colours at their disposal, and it has been shewn how colours may be so arranged with intervening masses of white, grey, or black, that the best results may be obtained. These results depend on the simultaneous contrasts which are excited, and the subject of such contrasts has been thoroughly investigated in chapters VIII., X., and XI. These matters, though apparently elementary, and really part of each individual's taste, are nevertheless governed by a series of rules, almost as easily defined as the rules of mathematics. It is the discovery of the rules which is the most trying point. But when discovered they must be carefully applied to obtain such combinations of colouring as shall prove acceptable to the majority of people with normal colour vision. In a similar way there are other rules attaching to colouring which are most important to those who are constantly working with coloured pigments indiscriminately in daylight and in artificial light. A series of well-conducted experiments soon proves that colours are altered by the conditions of the light surrounding them. This was pointed out in the early chapters, and some striking illustrations were given. It is now intended to reduce the matter to a number of well-defined instances, all of which most closely affect the artist and the colour printer.

Colour is changed by the amount, or rather the deficiency, of light which illuminates the body reflecting colour rays. There is, perhaps, no better instance of this than the coloured draperies of female or male attire, or house decoration. In either case, those portions fully exposed to light will give—if the light be full also—the full power of the colour, whilst parts at an angle to the source of light are deeper in hue, and those parts in the depths of the folds are almost devoid of colour. Another example which will be at once appreciated by every reader, is a sphere with its very bright lights and its dense shades; yet the sphere may be all of one colour, the difference arising from the varying quantity of white light which falls upon it.

Under this branch of the subject the matter may well be classified in the following manner. The changes caused by the difference of the amount or colour of light which falls upon any object may be dealt with as :—

The modifications of appearance caused by :—

1. Coloured light falling upon a body.
2. Diffused daylight and sunlight falling upon different parts of the same object.
3. Diffused (or ordinary) daylight only falling on a body and causing :—
   - (*a*) A maximum of white light to be reflected from a coloured object.
   - (*b*) A larger proportion of the actual colour of the object than white light to be reflected.
   - (*c*) The development of the complementary colour of the object to become apparent at some parts.
   - (*d*) Variations, because of the texture of self-coloured materials.
4. Artificial light :—
   - (*e*) Electric light.
     - (*a*) Arc light.
     - (*b*) Incandescent light.
   - (*f*) Gas light.
     - (*c*) Ordinary burner.
     - (*d*) Welsbach burner.
   - (*g*) Candle light.
   - (*h*) Oil light.
     - (*e*) Yellow, oil light.
     - (*f*) Pale-blue, oil light.

Certain sections of this classification closely affect our trade; especially that being the case with 3 (*c*), 4 (*e*) and (*f*).

Taking the modifications in order, the first, viz., 1, the effect of viewing a coloured object upon which coloured light is falling, is not so closely connected with our trade, except that by a side issue it throws light upon the whole of section 4. It is very seldom that in ordinary daily experience that objects are illuminated by coloured lights. Of course, in stage effects and pyrotechnic displays there is ample illustration of the whole modification which can take place under such conditions, and in a broad way it may be taken that whatever colour illuminates a body, that colour forces itself into combination with the colour of the object, and intensifies or materially alters the effect from that which is seen under white or diffused daylight.

Tabulating a series of results taken from Chevreul, the general effects are :—

That red light falling upon black, white, red, orange, yellow, light blue, and violet, simply adds a certain quantity of red to them, and produces purple—or rusty—black, pale red, deep red, deep orange, orange, violet, and purple.

Red light falling upon deep green produces red-black or brown, and upon light green a red or brownish yellow-grey.

That orange light falling upon black, white, orange, red, yellow, and light green, simply adds a quantity of orange to those colours, and produces brownish or maroon-black, pale orange, deep orange, scarlet, bright orange, and yellow-green.

Orange light falling upon deep green produces a brownish green; upon light blue an orange-grey; upon deep blue a reddish grey; upon indigo-blue an orange-maroon; upon violet a dark purplish grey.

That yellow light falling upon black, white, yellow, red, orange, green, light blue, and deep blue, simply adds a quantity of yellow to those colours, and produces dark olive, pale yellow, bright yellow, orange, bright orange, greenish yellow, yellow-green, and slaty-green.

Yellow light falling upon indigo produces deep orange-yellow, and upon violet a purplish-grey.

That green light falling upon black, white, light green, deep green, red, orange, yellow, light blue, indigo, and violet, simply adds a quantity of green light to those colours, and produces greenish-grey, pale green, bright green, deeper green, brown, faint yellowish-green, yellowish-green, blue-green, dull green, bluish-green drab (or brown).

That blue light falling upon black, white, red, blue, green, indigo, and violet, simply adds a quantity of blue to those colours, and produces bluish-black, pale blue, purple, bright blue, blue-green, blue-indigo, blue-violet.

Blue light falling upon yellow produces yellowish-grey, and upon orange plum-brown.

That violet light falling upon black, white, red, blue, indigo, and violet, simply adds a quantity of violet to those colours, and produces violet-black, pale violet, purple, bluish-violet, deep blue-violet, deep violet.

Violet light falling upon yellow produces purplish-brown (or grey), and upon orange a reddish-grey.

Of all these modifications the most important to the artist and printer are the effects of yellow and orange (gaslight and incandescent electric light) and blue (arc-electric light), the latter being only a very pale modification which is not easily perceptible. Although this tabulation of modifications represents in a general way the probabilities of modification, yet there are many circumstances, such as the materials of which a pigment is composed, or the fact that in printing one colour overlays another, that the actual modifications set forth cannot always be guaranteed to take place; whilst other modifications do actually become apparent. In ordinary landscape painting some of these modifications may be observed in the curious colours which are presented by glossy green leaves, and in old paintings themselves the varnish becomes yellow, and causes the colour of the paintings to be viewed through a yellow film, which brings together the chromatic effects, and adds a warmth to the whole production.

The second modification, caused by part of an object being illuminated by sunlight and part by daylight, is of very little importance to the general artist or printer. The effects produced may be turned to account by painters. The sum of a series of experiments is that the sunlight adds greater illumination, and adds a small quantity of yellow light. Thus a piece of red stuff, or pigmented surface, becomes brighter and more orange under sunlight, whilst the portion illuminated by daylight apparently loses some of its colour, and is turned slightly more grey. The effects on other colours can be determined from the tabulations given above. As a further consideration of this modification, it is of considerable value to note the changes which take place in colours as the amount of illumination is increased or decreased. The spectrum itself serves as an illustration. Taking a bright spectrum, and gradually reducing the light from which it emanates, the actual positions of the colours are first of all seen to change and become more central, and at the same time some of the finer shades disappear, leaving in a little time a spectrum of red, green, and violet. By further reducing the light, the spectrum colours become brownish-red, dull green, and dull violet. By further reduction, the colours become only a reddish-brown and pale green. And last of all, only a faint green remains, which reminds one of the pale moonlight. Studying the effect of decrease of illumination by means of the spectrum, scarcely touches the point of pigments, and a few illustrations of the effect of the increase and decrease of illumination upon pigments will shew how far the artist and printer may be affected in their judgment of colour. Thus, in adopting Church's tabulation, the following are some readily appreciable effects:—

By increasing the light,			By decreasing the light,
Red	becomes	scarlet	purplish.
Scarlet	,,	orange	red.
Orange	,,	yellow	brown.
Yellow	,,	paler	olive-green.
Yellow-green	,,	yellower	greener.
Blue-green	,,	more blue	greener.
Artificial ultramarine	,,	blue	more violet.
Violet	,,	more blue	purple.
Purple	,,	redder	more violet.

From these instances anyone can see how other colours would be affected by changes in illumination. It seems very probable that the lower the illumination goes the more are the sensations of blue developed in our eyes. For when white and black pigments are mixed, there is a certain blue shade developed at the same time. It has been shewn in the early chapters how that certain proportions of colour, rotated upon a disc together, give certain combined colour effects, and that by this means the proportions of different colours to form a certain compound colour can be determined. When, therefore, white and black are rotated upon the disc, they do not give the same grey that is produced by mixing black and white pigments. It is necessary to add a small proportion of blue on the disc to give the grey.

This same variation in illumination causes the effects of change of hue upon draperies. A bright satin robe shews almost every variety of the actual colour of the robe, from white down to a deep grey, owing to the great variation in the illumination of its creased and folded surfaces.

The artist requires to be very careful in the treatment of fully and partially illuminated surfaces, for the colour of a body varies not only in intensity of tone, but also in hue, according as it is illuminated directly by sunlight, by diffused daylight, or by diffused reflected light. The very colour of the atmosphere, with its pure blue above gradually declining to grey or red at the horizon, depends upon these changes in the illumination of the atmosphere assisted by the prismatic effects of the particles of moisture suspended. When the sun's light is reflected from distant hills, it frequently happens that the colour is warm, owing to the most refrangible light having been bent out of the line of sight of the spectator. This same cause results in the ruddy appearance of the sun itself


"And the village streets are
fresh and fair,
And with joy that is almost
pain
My heart goes back to wander there,
And among the dreams of the
days that were,
I find my lost youth again"

towards evening. At the same period of the day the sun's light illuminates the very mountains with a warm glow, whilst the more shaded portions reflect the blue and darker grey tones. The same rules apply to the colours of clouds, which, when fully illuminated, are a brilliant golden white; and at other times, when much less illuminated, are various shades of grey, or even purple.

The differences of illumination also affect colours of ordinary objects, inasmuch as the outside and inside of a golden vase or cup appear of distinctly different hues. Other coloured objects are affected in the same way, the concavities and high reliefs shewing the extremes in hue.

The third modification, with its four sections, has become apparent from the preceding remarks. In section A it is easy to see that in certain positions, any coloured object having the slightest evenness of face, which will give a moderate amount of reflection, the light reflected will be nearly, if not quite, white. Such instances as a coloured glass or metal sphere, or yellow silk, readily give these effects, and almost contiguous to such bright reflecting parts will be found certain areas where the colour of the object itself is most apparent, as defined in section B. And where there is any amount of these variations giving high lights and greys and brilliantly coloured portions, the eye cannot help, by reason of the general law of complementary colour sensation, but see the complementary colour of the object apparent at all the parts where there is an absence of colour, but a fair white illumination. Similarly, as set forth in section D, if a material be a fine nap, and its colour dark, then when viewed in certain lights some parts will give the pure colour of the material from the nap, whilst the darker portions will excite the complementary colour sensation tinged with grey.

The fourth modification is due to the effect of artificial lights, and to some extent the effects can be summarised from what has already been said. The lights which may be used in printing establishments and other places may be limited to arc electric, incandescent electric, ordinary gas burner, and the Welsbach gas burner. As to the use of candles and oil lamps, nothing further need be said than that candle light is even yellower than gas; some oils burn yellow, and some oils burn almost a white light, bordering on blue. As to the arc light and Welsbach light there is a decided similarity, and between gas and the incandescent electric light there is a close relation. The incandescent lamps can be made to glow much whiter by increasing the strength of the current. But generally the incandescent light is a pale yellow. Yellow illumination causes, as already seen, a very great change in the colour of an object, and it is for that reason that printers and artists should either not attempt to pass their colours in gaslight, or should be so well versed in the changes caused by gaslight as to be able to guard against them. In gaslight, everything which is of a pale yellow colour apparently loses its colour and becomes white. An orange colour appears yellow, and blue, green, violet, and purple also suffer changes. Thus, Rood in his experiments determined that by gaslight:—

Carmine	becomes	intense and bright red.
Blue-green	,,	rather pale yellowish-green.
Orange	,,	more brilliant orange.
Greenish-blue	,,	rather pale greenish-yellow.
Yellow	,,	rather an orange-yellow.
Blue	,,	neutral grey.
Greenish-yellow	,,	yellow.
Violet	,,	decided red purple.
Artificial ultramarine	,,	violet.

It is well known that ordinary green pigments become difficult to distinguish as green in gaslight, they so closely approach blue; and, *vice versâ*, some blues become almost green. Cobalt blue and artificial ultramarine become somewhat purplish, and are easily distinguished from green.

In conclusion, the only artificial lights in which colours are the least affected are the white lights of the arc electric lamp, and the incandescent zirconia mantle of the Welsbach gas burner. The incandescent electric lamp can be brought to such a state of white heat that its light does not materially affect the colour of any object under inspection.

THE Art Gallery Committee of the City of Manchester has arranged to hold an exhibition of contemporary arts and crafts, in the rooms of the City Art Gallery, in April next. It is sought to bring together a display of fine examples of industrial art, with a view to educate the public taste, and to stimulate the desire for all that is excellent in design and workmanship. Especially is it desired to identify the actual designers and skilled workers in respect of the exhibits offered. The committee hopes to receive amongst other exhibits examples of decorative painting—sculpture and modelled work—wood, stone, and ivory carving—mosaic work, particularly in association with architectural and cabinet work—specimens of engraving and printing—book decoration and binding—printers' ornaments—illuminated and decorated MSS.—ornamental leather work—wall papers, and other forms of surface decoration—photography—designs and cartoons for decoration of all kinds—architectural, mechanical, and ship models. The committee invites the co-operation of employers, trade guilds and societies, and of others interested in the promotion of artistic industries, with the object of ensuring an exhibition of high merit. No charge will be made for space, and exhibitors will be permitted to put a price upon their works. Those wishing to exhibit should at once apply for a prospectus to the curator of the City Art Gallery, Manchester.

EASTNOR CASTLE.

The City and Guilds Examination in Lithography, 1894.

(Continued).

HONOURS GRADE.

QUESTION I.—Describe a method of making up a tint stone of four gradations, using transfers from a single line tint plate.

ANSWER: To prepare a tint stone having four gradations of shade, and having only a single ruled plate to do it with, requires but the disposition of the transfers of ruled lines one over the other in such cross directions as to obtain four different directions. To effect this, the first gradation of tint must be carefully gummed out upon the clean stone—of course to an offset or traced outline. The stone is then slightly warmed, and sheets of ruling transfers are laid over all in one direction, viz., left to right. The transfers are put down and the stone thoroughly washed in hot water, and finally washed in very weak nitric acid. The stone being clean, a new offset or tracing is made, and the second tint carefully gummed out. Upon this the sheets of ruling transfers are laid in the direction of right to left. After these transfers are put down, it is advisable before again cleaning to rub up the two rulings thus put down, and proceed to clean the stone as before. Again an offset must be put down and the third tint gummed out; upon this the ruling transfers are laid horizontally. But in this third transferring, and in the fourth, the stone should be well warmed to assist the ruling in getting a good hold. The same series of operations in transferring, rubbing up, cleaning, putting down an offset, and gumming out the fourth tint follow, then the ruling is put on vertically and the four gradations obtained.

QUESTION II.—Describe the utility of plaster of Paris in transfer paper, and name some other substances which may be used for a similar purpose.

ANSWER: Plaster of Paris is used in transfer paper compositions to give body, to assist in producing a smooth surface, to allow for erasures, and to dilute the gelatines in the composition to assist in the ready separation of the composition from the paper. The papers which really require body are copperplate transfer papers and grained transfer papers, whilst all require a smooth surface. It is, however, not necessary to use plaster of Paris in all transfer papers; in the two kinds named it may be substituted by chalk or stucco.

QUESTION III.—Describe Hullmandel's litho-tint process or a similar process for imitating India ink or similar drawings.

ANSWER: The oldest method of imitating Indian ink drawings was that of Senefelder, and it is a process which has quite recently been again experimented with, giving moderately successful results. The method is to wash over soap-water upon a grained stone, and when dry to just wash off the surface of this film with turpentine. Upon the stone thus prepared the drawing is worked out in washes. The ink used for the washes is a hard litho writing ink, containing a large proportion of soap, being not unlike chalking crayons in composition. These washes settle down in the grain of the stone, and when dry the surface of the stone may be rubbed with flannel to clear the points of the grain. The grain having been thus exposed, the stone is etched with dilute nitric acid and water. The method of etching is to leave the acid-water upon the stone until it effervesces. The effervescence is slow, and shews itself as bubbles at the tops of the grain. These bubbles must be swept away by using a brush to allow the etching to proceed in an even manner. The weak acid-water will become exhausted and must be replenished several times until the stone is well etched. A drawing executed in this manner is not by any means finished. The very darkest shades will require to be chalked in after the tintings are washed in; and outlines must be done either at first or at the finish. The drawing taken may require a lot of regulating. Parts will require to be stopped out, and the margin protected before commencing.

Hullmandel considered that he improved the process by adopting another stage in the execution. Thus, instead of rubbing off the tints from the grain and proceeding to etch, he covered the stone with a resist of resin 4½-ozs., pitch ¼-oz., and methylated spirit one quart. When this was dry he etched with nitric acid and gum solution in the proportion of one to six.

Drawings in this style, as well as those executed by Hullmandel in 1824 by a drabbing process of tinting, were undoubtedly very delicate and shewed considerable artistic merit.

QUESTION IV.—Describe the anastatic process of lithography or zincography.

ANSWER: The anastatic process, either in lithography or zincography, consists in putting down as a transfer any recently printed impression of block or letterpress work. Originally, the class of ink used for pulling and printing the best classes of letterpress work was one containing a fair proportion of grease; but latterly the letterpress inks have been so cheapened that they consist of little more than lampblack and oil, the latter in very small proportion. When blocks, etc., were pulled in a good ink, it was possible, by taking any recently pulled impression and damping its back with weak nitric acid solution, to put it down upon stone or zinc as a transfer. When put to stone, it is better to wipe it over with turpentine and let it evaporate. However well these would-be transfers were put down, they were seldom brilliant successes. So with an improvement in the copyright law, and a degeneration of the ink used, the practice has fallen out of use.

QUESTION V.—Describe the appliances for and method of employing india-rubber sheets for making enlarged or reduced transfers on stone.

ANSWER: It is probably twenty years since the introduction of Fougeadoire's enlarging or reducing machines, consisting of a sheet of india-rubber fitted with eyelets all around its edges adapted to receive hooks. These hooks are the ends of bars, which extend from the rubber outwards, and are carried as bands around a worm, being adjusted closely to the worm by thumb-screws. These worms are arranged along the four sides of the rubber sheet, and where they cross at the corners are mitred and pinioned so that the movement of one worm causes an exactly equal motion in the other three worms. By that means only one handle is necessary. The same motion from one handle could be imparted by mitre wheels at the handle and chain gearing around the outer framework.

In use, the india-rubber sheet is arranged to meet the object in view. If the object is to enlarge, then the rubber is brought down to its natural size; if the object is to reduce, then the rubber sheet is expanded. In either case the rubber sheet is well talced, and the impression is pulled upon it from the stone. Then the rubber is either expanded or allowed to return to its natural size for reduction. The winding apparatus is capable of the finest adjustment, and the image or transfer upon the rubber can be made to any size before being again transferred directly from the rubber.

Photo-lithography has very largely displaced this machine, and does the work with even greater precision.

QUESTION VI.—Describe some method of making a photograph in printing ink.

ANSWER: The question is so peculiarly worded that it fails to convey any intelligible meaning. "Making a photograph in printing ink" may mean anything or nothing. To "make a photograph," or rather to photograph, is to allow the action of the light to make a picture or design through some stencil. How it is to "make a photograph," or rather photograph in printing ink, seems somewhat outside the range of recent experiments.

The methods of producing copies of photographs in printing are numerous; these including

Woodburytype, collotype, leimtype, photogravure, photo-lithography, line and half-tone zinc blocks, all of which have methods peculiar to themselves.

QUESTION VII.—Describe a process of photo-lithography in which bichromatised gum is used.

ANSWER: Gum is so readily soluble as to render it a very awkward material to use in photo-lithography. The hardest gums might be used instead of gelatine in any of the processes, but a great amount of care would be necessary. Some years ago a method of half-tone photo-lithography was attempted by putting a solution of bichromatised gum upon a litho stone. When dry it was exposed under a negative until the picture was well printed. After removing the negative, the unexposed gum was washed away, whilst the exposed gum had become sufficiently hard to be capable of taking printing ink. The durability of this film was very uncertain, and after a very limited number of impressions had been taken, the bichromatised gum film generally began to break away from the stone.

QUESTION VIII.—What is the difference between line engraving and etching on copper? Briefly describe each process and tools used.

ANSWER: The difference between the actual line engraving upon the copper, and the etching upon the copper, is that the line engraving contains all the gradations of light and shade worked out in thick, thin, straight, and wavy lines; whilst the etching on the copper is but a series of ragged lines constituting little more than a skeleton of the finished picture, and with very little attempt to obtain the absolute light and shade of the picture by the etching of lines. The difference again becomes apparent in the printing process. In printing a line engraving, the engraved lines upon the plate must be properly filled with ink, and the plate otherwise wiped clean; whilst in printing an etching, the lines of the etching are well charged with ink, and so is the face of the plate. The lines are only wiped out where lights are required, and the larger gradations of light and shade are worked out by more or less wiping the ink from the face of the plate.

To execute a line engraving, the plate receives a wax film, upon which the picture is traced in outline. This tracing is scratched lightly through the wax so as to give a mere idea of the shapes to be dealt with. After clearing the wax off, the plate should be smeared with brown or black mixed in oil, then the engraver starts his work with his gravers to cut in the shapes and shades. The gravers must be ground to present an obtuse elliptical point, and fine triangular points of varying widths; each graver being used to form its own particular line. The triangular gravers are used to form the fine and broad deep lines; the elliptical ones for the shallow lines. Rough edges caused by this cutting process are pared off with a keen hollow-ground triangular scraper, and the final burnishing is done with a long, oval, polished steel tool.

In etching, the first point is to lay a ground of black, and either sketch out or trace the subject upon it. The heaviest portions of the picture are then drawn with a steel point upon the black ground. This etching tool or needle removes the black and leaves the copper bare. Such parts as require the most etching are cut first, and when complete the plate is etched. The etching having proceeded to the desired extent, the acid is washed off, and the "drawing" can be proceeded with. The middle distance is the main part "drawn" in this second operation, and such other parts as require to be of a medium depth. When complete this is etched, and of course the first parts which were scraped out are etched a second time, unless covered with the resisting grounding. The plate is again washed, and the drawing resumed. This time the extreme distance and the light touches are put in. The plate is again etched. In this third etching, the first parts scraped out receive their third etching; the second parts scraped out, their second etching; and the third parts scraped out, their first etching; thus giving three distinct gradations of line. Etching is not restricted in this sense at all; there may be a dozen different etchings, and thus a dozen gradations of line. Finally the etcher clears off the ground and takes a clean proof, followed by a "painted" proof to judge its full effect. Anything can be added or burnished out, either by further etching methods or by using the gravers of the line engraver.

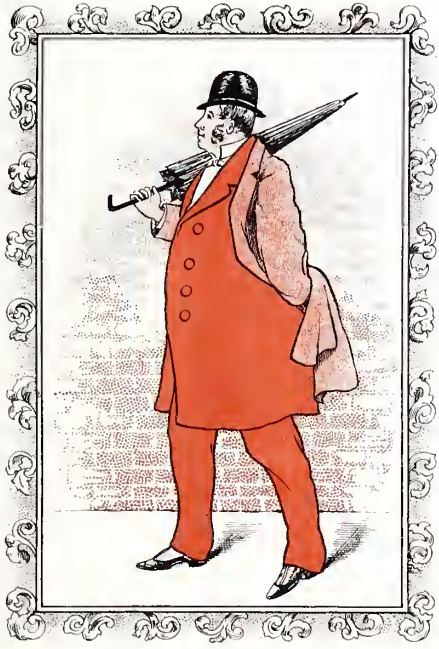
QUESTION IX.—Shortly, but distinctly, describe the differences between a photograph (in silver), collograph (collotype), hectograph, heliotype and typograph.

ANSWER: A *photograph*, or photogram, is the result of taking a picture (or any other design) by means of a camera, upon a sheet of sensitised glass or film, and printing from such glass or film upon a sheet of sensitised paper. The latter is developed and fixed, and becomes a comparatively permanent picture. This process takes a long time to produce a quantity.

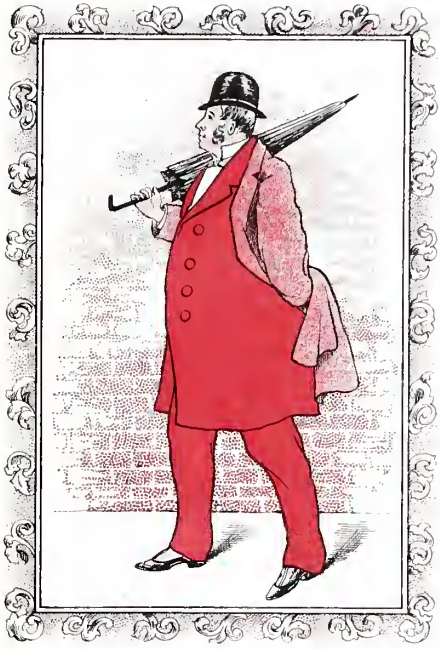
A *collograph* is a print in any colour of printing ink, taken from a picture upon gelatine. The picture upon the gelatine was originally produced by using the sensitised gelatine to receive the photograph or photogram, instead of the sensitised paper as in the above. By this process a large number of excellent prints can be procured in a shorter time than by the above process.

A *hectograph* is a copy produced from a machine called a "hektograph" (or hectograph). This machine consists of a tablet of a gelatinous nature which acts as a substitute for a litho stone. The writing is made in the original handwriting of

Absolutely Fast in Light. Economical in working.



MADDER LAKE 139.

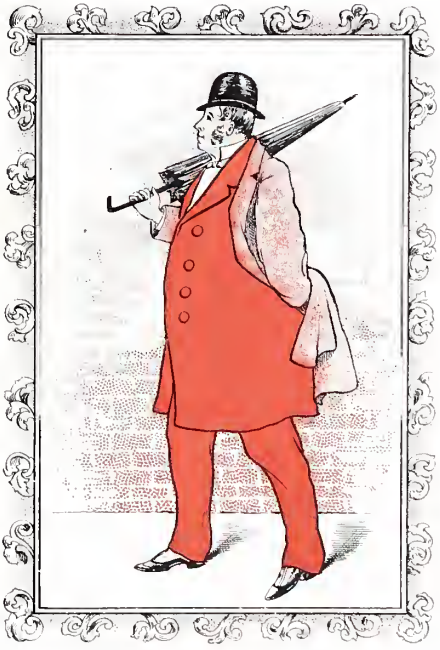


MADDER LAKE 142.

Madder Lakes made by Mander Brothers.

Either the DRY COLOUR or the same made into INK can be supplied.

MADDER LAKE 148.



MADDER LAKE 144.

In ordering, please quote the Number, and state whether Ink or Dry Colour is wanted.

anyone upon a transfer sheet of an oiled-paper nature, and in an ink supplied by the hektograph makers. This transfer sheet is placed upon the gelatinous plate and the writing is transferred to the plate by rubbing it down. The writing which is thus transferred, is in itself so full of ink, that by placing sheets of clean paper successively upon the gelatinous plate and rubbing them, a fair copy is taken. The word hektograph means "one hundred writings," but in practice it often happens that only about fifty "writings" can be made.

A *heliotype* (from helios—sun and type) is, to all intents and purposes, the same as collotype (collograph). The gelatine film is usually removable from its original support, and can be mounted upon any support to print from it. It may be printed either in a special collotype press, a lithographic press, or Albion press.

A *typograph* is any ordinary letterpress production. The method of production is to ink the face of any cast letters or cut picture, and lay the paper upon it to receive the impression.

Question X.—How does an aquatint engraving on copper differ from a mezzotint engraving?

Answer: An aquatint engraving is produced by spreading a "ground" upon a copper plate, which ("ground") has the property of crystallising when drying. This crystallisation causes the ground to be broken up into a well-defined mechanical grain. The plate is then submitted to an acid bath, and the mechanical grain is etched upon it. Such a plate is used as a groundwork to work out a picture upon either in line or by etching, and the resultant picture shews distinctly in the shades the mechanical grain. In the lightest parts of the picture the grain is burnished or scraped away.

A mezzotint, in description, contains a somewhat similar series of operations. In the first place, the plate is abraided with a file-like tool until the whole surface is broken up into evenly distributed hollows, so close together that, when printed from, the plate gives an even, velvety, black surface. This surface is quite distinct from an aquatint surface which presents a mechanical grain. The mezzotint picture is finished by burnishing down the abrasions in different degrees. Thus, white is produced by burnishing the abrasions away and leaving a plain copper surface. From black to absolute white, the burnishing is carried to different depths, to obtain all the varying shades of the picture. In this way, pictures with very rich shadows and depths are produced quite different to any other mode of engraving.

Question XI.—Describe the difference between the autotype (carbon printing) and the Woodburytype (glyphotype) processes.

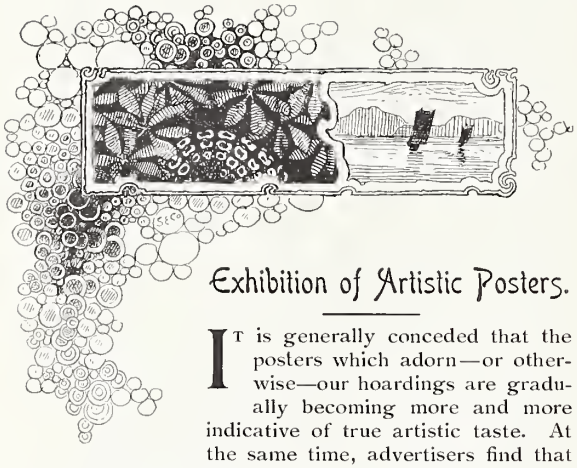
Answer: The carbon process of printing consists in producing, one by one, pigment pictures embedded in gelatine, which may be mounted upon any surface. The gelatine containing the picture is originally sensitised with potassium or other bichromate, and it is also well loaded with the pigment—either black, brown, purple, or red—which ultimately forms the picture. Such a film of gelatine exposed under a negative, produces a reversed positive photograph upon the gelatine. The gelatine film should be mounted upon a support, and washed in water until all the unexposed gelatine and chromate have been washed out. In washing out the unexposed portions it washes the pigment away also, and only leaves the pigment held fast in the gelatine, where, by exposure to light, the gelatine has become hardened.

The Woodburytype process is almost a direct production of a photograph in printing ink. The method is, briefly, to use such a thick sensitive film upon the glass or "film" in the camera, so that when it is soaked in water it swells and shews a considerable amount of relief. Such a swelled film, when dry, can be absolutely pressed into lead, and leave in the metal the finest gradations of shade. This lead matrix can be used to print from. The matrix is filled with a gelatinous ink, and carefully cleaned. Upon this is placed the paper to receive the print, and it is locked up in the special press until the ink sets. In this way prints are produced closely resembling silver prints.

Question XII.—Describe two methods of laying aquatint grounds for etching.

Answer: Aquatint grounds may be laid by carefully dusting a heated plate with salt, on the top of the etching ground, which when cool could be washed. The salt will wash out and leave innumerable fine holes in the etching ground, through which the acid could bite and produce dots in the plate, to form a tint—aquatint. Another plan is to dust fine resin through a muslin frame down upon a plate. The plate is then heated to fix the resin, and finally etched. When cleaned and washed, the resin will have protected the copper and the plate is bitten with a symmetrical tint—aquatint—between the resin dust. The dust resin may be put on in a box as for photogravure. Fine resin dust is shaken up in a box, and after a little pause to allow the heavier particles to settle, the copper plate may be introduced. The fine resin will settle upon it, and should be warmed to fix it. Then it is etched, and the etching produces a granulated surface on the copper. Yet another method is to make a solution of resin in methylated spirit, and pour it on the plate, allowing the surplus to run off, and leaving only a thin film upon it. In drying, this film cracks up symmetrically and leaves little fissures through which the acid can bite and thus form a tint—aquatint (M. Brunet Debaines' method.)

In working aquatint engraving it is advisable to make the tracing—scratching—of the picture before the aquatint grounding is etched on.



Exhibition of Artistic Posters.

It is generally conceded that the posters which adorn—or otherwise—our hoardings are gradually becoming more and more indicative of true artistic taste. At the same time, advertisers find that the pictorial posters designed in novel style form most desirable advertisement mediums.

For this reason the Exhibition of Artistic Posters at the Aquarium, opened on October 24th, is well worth the attention of artists and lithographers. It is the first of its kind held in this country, and has been arranged at a most opportune moment. Thus it comes about that the galleries of the Aquarium have received the now famous poster exhibition, and *tout le monde* may see Parisian posters and British posters "cheek by jowl," and artistically displayed withal.

An examination of this collection shews that, at least as regards general artistic posters, we are behind our artist neighbours in France, and amongst the hundreds of posters on exhibition a large proportion bear French imprints. There are some fifty of the finest productions of Jules Chéret; the whole of the famous Buttes Chaumont series; the Saxoleine series; the principal Jardin de Paris, Horloge, Louvre, and Folies Bergère, including the four famous Loie Fuller, etc., are exhibited. A set of the Grasset posters; the Toulouse-Lautrec series; the Steinlen posters; the principal works of Ibels and Bonnard, Forain, Choubrac, Grevin, Metivet, Mayet, Aman, Jean, and a wide selection of Willette, from the leading features of the French school. The British posters are sufficiently known, and are represented by those of Herkomer, Fowler, Walter Crane, Schmalz, Sumner, Steer, Dudley Hardy, Aubrey Beardsley, and the Oxford burlesques of Beardsley's.

The collection includes a few designs for posters by British artists only, those of the Beggarstaff brothers being perhaps amongst the most original and daring.

Of the artists whose work is thus receiving prominence, Jules Chéret is now known as the author of some four hundred pictorial posters, many of which are of the largest dimensions and of considerable artistic merit. His work is purely lithographic, and designing directly upon the stone, he has attained a delicacy of colour and a freshness of line particularly noticeable in his types of female beauty. His effects of reflected light form a great attraction to his designs.

Grasset's effects are obtained with the aid of photography, and differing from the technical skill of the trained lithographer, as shewn in Chéret's work, Grassett applies to his productions the strict conventuality acquired in the designing of stained glass. The almost satanic powers of Lautrec, the Gallic wit of Willette, and the sympathetic touches of Steinlen, are contrasts marking out the authors as masters in their respective lines.

Quite different in style, and partaking much of the national characteristics—as contrasting with the richness, the vigour and life of the French posters—the few English posters which may be specialised are from the brushes of Dudley Hardy, Ravenhill, Fred. Walker, and Sickert, and also a couple of Aubrey Beardsley's grotesque creations.

To the average observer, the effects obtained by the display of these posters will come as a pleasant surprise, while artists and printers cannot fail to be interested in the pleasing and instructive collection.

The appropriate catalogue, compiled by Mr. J. Thacker Clarke, materially aids the visitor, and will be prized by poster collectors.

* * * * *

Raphael Tuck & Sons' Prize Competitions.

The name of the above firm is not only synonymous with high-class art publications, but is also known in art circles as the originators of a wide series of competitions in connection with their productions. Last year's competition was most satisfactory, no less than 15,000 competitors having entered. We have before us particulars of the new "Amateurs' Literary and Painting Prize Competition," consisting of various specimens of books, booklets, and calendars issued in connection with the Literary Prize Competition, and studies eligible for the next Amateur Painting Prize Competition. The next competitions will be held simultaneously in May, 1895, under the respective presidencies of Mr. Walter Besant and Mr. Marcus Stone, R.A. The competitions are divided into three classes, all open to the majority of B.L. readers. These are:

(1) "The Amateurs' Literary Competition," with 1,640 prizes, of total value of 1,000 guineas.

(2) "The Amateurs' Painting Competition" (books and calendars) with 1,270 prizes, of the total value of 800 guineas—including a children's competition.

(3) "The Amateurs' Study Competition," with prizes of the total value of 1,200 guineas.

Of the first class, the following books and calendars may be singled out as examples:—

"Children from Many Lands," calendar for 1895, twelve coloured leaflets, embossed, 25/-; "King Robert of Sicily," sixteen coloured illustrations, cloth, 10/6—a magnificent work; "The Old Master," calendar for 1895, six leaflets with etchings, 5/-; "Little Pansy People," twenty pages, embossed, 2/6; "Songs of the Snow," and "Songs of the Books," sixteen pages, six coloured illustrations, embossed, 2/6; "Songs of the Watermill," sixteen pages, embossed, 2/-. As beautiful and most artistic books and calendars, these will receive a welcome from the most critical.

Amongst the three books typical of the "Children's Literary Competition," "Our Village," sixteen pages, coloured illustrations, 1/- (or on linen, 2/-), is a splendid specimen of juvenile books.

Typical of the "Amateurs' Painting Competition," which includes a wide range, the panel wall calendars at 2/6 are truly artistic and genuinely attractive. The "Familiar Friends' Painting Book" for the "Children's Painting Competition" possesses eight coloured illustrations and fifty-four pages in outline, and will take like "hot cakes."

In the "Amateurs' Study Painting Competition" our artists will find much scope for their ability. There are five sections:—(1) Door Panel Studies; (2) British and American Scenery; (3) Flower, Fruit, and Bird Studies; (4) Marine and Landscape Studies; (5) Head, Figure, and Animal Studies. Of the Door Panel Studies, the twenty-two different sets of studies are each and every of beautiful design and tasteful treatment, and are adapted for the ornamentation of dining-rooms, drawing-rooms or bedrooms. In their subjects they represent floral and fruit pieces principally, and we find they are designed by such artists as W. S. Coleman, Bertha Maguire, Prof. Chellazi, Ellen Welby, and Kate Saddle. Each set consists of two top panels (about $41\frac{1}{2} \times 10\frac{1}{2}$ in.), and two bottom panels ($20 \times 10\frac{1}{2}$in.), each adapted for cutting down, if necessary, and may be obtained at 15/- per set, except the "Cupid" set, which is priced at 21/-. The handy album received contains the twenty-two sets in miniature, shewing the panel decorations fixed on doors. This set may be obtained for 2/6, and is well worth acquiring by every artist.

Of the sixty-five different views of "British and American Scenery," we need only say that judging from specimens, they are masterpieces of chromo-lithography.

In the third section, Miss Ellen Welby's "Six Studies of Floral Gems" are part of a series of sixty-four examples, and are splendidly drawn and most realistic in finish and treatment. Prices range from 1/- to 3/-. The remaining sections are similarly first-class in conception and excellent in treatment.

We recommend our friends to obtain a prospectus of these competitions—whether they have any idea of competing or not. Particulars will be sent, on application to Messrs. Raphael Tuck & Sons, 72 and 73 Coleman-street, London, E.C.

Confirmation Strong

Of our oft-repeated assertion, here and elsewhere, that chromo-lithographic work can be produced in the British Isles equal to the very finest "Made Abroad" productions, comes to hand in the shape of specimens of various cards—"Reward," Xmas, and New Year—from Messrs. **Marcus Ward & Co., Ltd.**, Oriel House, Farringdon-street, E.C. There is a wonderful variety of subject and design evident in the chromo-litho work of this firm, and we congratulate them on the genuinely artistic treatment and most admirable colour effects observable throughout the specimens to hand.

The "Reward" cards form a wide series, and are specially intended for the use of Sunday schools. Amongst the shilling set, a packet of twelve cards may be instanced. These are about 7×5-in., and contain delicately printed landscape views as centres, with suitable texts in panel at foot. The sixpenny series range in sizes about 4×3-in. A type of these is "Bells Across the Snow"—each card bearing its winter landscape, fresh and dainty in treatment. The paper covers are treated with equal care in design and colouring. No. 441 contains views set in gold-bordered panels—veritable gems. The "International Scripture Lessons" are most attractively got up, shewing charming seascapes and holly sprays.

Other packets of the same price bear realistically treated wild briar sprays, forget-me-nots, and other floral decorations. "On the Threshold" is an example of the combination of child-subjects—equally pleasing. "The Calendar of the Seasons," $4\frac{1}{2} \times 3$, bears female figures, representative of the four seasons, and is enclosed in chocolate coloured cover. A three-fold screen calendar, and a $7 \times 6\frac{1}{2}$-in. vessel on stiff card, carrying dates on sails, will prove very attractive. Of the same price, a two-folder, bearing realistically coloured and embossed facsimile "Coins of the New Testament," is both a handsome lithographic production and an indispensable aid to the Sunday school teacher. A rococo-bordered French screen, four-fold, contains quite a series of tasteful views. The "Boudoir," the "Shakespeare," and "Tennyson" wall calendars—the first 6×6-in., and the other two 10×7-in.—each bear nicely-executed and appropriate views, both useful and ornamental.

Of the fourpenny series, a small French four-fold screen, 5×3-in., is daintily produced in gold and colours. In the threepenny series various Xmas and New Year cards find places. These comprise single, two, three, and four-folders, with every conceivable variety of shape, cutting, and turning; likewise rough, smooth, scalloped, gold, and bevelled edges, and ribbon and tinsel fastenings.

Messrs. Marcus Ward & Co., Ltd., deserve the heartiest support for their productions—which do English lithography credit.

Book Notes.

WELL meriting its popularity, "In Town" continues its course as an ably-conducted, superbly-illustrated, and well-printed monthly. The Xmas number is noteworthy as containing seven separate coloured plates, each of them pleasing and artistic in subject, and all attractively produced. Our illustration is a type of the artistically conceived designs utilised for this journal. The reading matter is always highly interesting.

AMONGST the practical endeavours to re-introduce the art of wood engraving for magazine illustration, the publication of *Illustrated Modern Art and Literature* must take a high place. The journal is copiously illustrated from wood blocks, the various coloured sketches being very effective. Although published in London, the enterprise is practically German, all the plates for prints having been produced in Berlin. The illustrations are exceedingly good throughout.

"A Necklace of Pearls," from "In Town.

By kind permission of the Proprietor.

WE have received the first number of "The London Technical Education Gazette," the official circular of the Technical Education Board of the London County Council. This new venture contains official announcements of the Technical Education Board which are of general interest to the teachers and managers of the educational institutions in London, and, in general, caters to technical education arrangements. In the official list of classes, the following are intended for members of the printing and allied trades:—*Bookbinding*—People's Palace, Mile End-road; Polytechnic, Borough-road. *Photography*—Birkbeck Institution, Bream's-buildings, Chancery-lane; People's Palace, Mile End-road; Regent-street; Battersea Park-road; and William-street Polytechnic, Woolwich; Goldsmith's Institute, New Cross. *Typography and Lithography*—St. Bride Foundation Institute, Bride-lane, Fleet-street; People's Palace, Mile End-road; Aldenham Institute, Goldington-crescent, St. Pancras-road; Regent-street and Borough-road Polytechnics. *Wood engraving*—Regent-street Polytechnic.

LITERATURE relating to photographic reproductions is being almost daily enriched by works from the hands of experts, and amongst the latest is one of A. Hartleben's technical series, "Reproductions—Photographie," by J. Husnik (A. Hartleben, Leipzig; 4/6). In some 150 pages, including numerous illustrations amongst the text, and five full-page plates, the whole course of present-day photographic reproduction is detailed, the apparatus and materials used, the processes and minutiæ involved, and the hints which tend to assist the worker in photo-zinco, photo-litho, and photo-reproduction generally, are here set forth. The matter is well arranged for study and for easy reference, and the reputation of the author as amongst the very foremost of photo-process workers, acts as an incentive to study his methods. All workers interested in reproduction by photo-mechanical methods should endeavour to avail themselves of the hints here set forth. Any such, possessing a reading acquaintance with the German language, must not fail to make the most of the assistance the book offers.

FOOD for moralising may be found in the news that one Fridolin de Holbein, a photographer, the last descendant of the great artist, aged sixty-eight, was sentenced to imprisonment at Aassig-sur-Elbe (Bohemia) for soliciting alms.

WE understand that Greenland has now a paper of its own. It is called *Aviagagliotis Nalenginnamik Sysaraminassassimik*, and good naturedly pardons any contemporaries "lifting" from its columns without acknowledging the source.

From photographs by A. Ellis, 20 Upper Baker-street, and London Stereoscopic Co., Regent-street, W.

"**Photolithographie,**" by George Fritz, Vice-director of the Vienna State Printing Office (Wilhelm Knapp, Halle A.S.; demy 8vo; 8 marks), forms probably the very latest and most complete manual on photo-lithographic methods received by us. The author has a reputation far beyond his own office, and is a recognised and reliable authority on photographic applications. In this work of some 160-pp., and which, by the way, is well arranged and excellently printed, the whole art of photo-lithography is carefully and minutely described from a practician's point of view. Commencing with the printing materials used—the litho stone, zinc plates, etc., and their treatment—he follows on methodically to the reproduction of subjects intended for photo-litho and the actual printing processes; detailing also the photographic process, the fitting up of the atelier, hints regarding the negatives, and the actual procedure are each included. A splendid series of chapters deals with the ordinary run of photo-litho methods; with an examination into these, and a minute description of the methods employed for the best and most successful applications. Following upon the descriptive pages are specimens of Angerer and Göschl's "Zeichnenpapiere" illustrations, shewing specimen of reduction by photo-litho, one-third and two-thirds of the originals; a magnificent specimen of photo-litho from copper plate; an autotype direct from original; an equally first-class photo-litho portrait by the well-known house of Orell, Füssli and Co., Zurich; a dainty positive print of handsome book cover and chromo-gelatine negative print of same; an autotype from original blue print; and a perfectly produced toned specimen of map printing. Fortunate indeed are British workers who possess sufficient knowledge of the language of the Fatherland to enable them to utilise the contents of this most valuable work. We cordially recommend it to such.

THE illustration at head of another page of "Eastnor Castle" is taken from "**Malvern Illustrated,**" a sixpenny demy 4to, descriptive of the beauties of the Malvern district. Readable and splendidly illustrated from pen-and-ink sketches, the booklet should prove a capital advertisement for the district. Mr. Ed. J. Burrow, of Malvern, has executed the whole of the drawings for the illustrations, and they do him much credit as a skilled artist.

* * * * *

WE regret to announce the death, on November 4th, at the age of sixty, of Mr. Philip Gilbert Hamerton, the editor of the *Portfolio,* and well known in artistic circles by his numerous works of art. Mr. Hamerton was an honorary member of the Burlington Club, of the Royal Society of Painter Etchers, of the French Academy, and of various artist and learned societies.

The "Rapid" Substitute for Grinding Stone.

AN INTERESTING TEST.

OWING to the different opinions expressed as to the capabilities of the "Rapid" Stone Grinder, it has been put to some severe practical tests in the demonstrations at the Manchester Technical School and elsewhere, and it has been proved to accomplish all that is claimed for it, if not more.

One test, of an exceptionally useful character in small printing establishments, was for the purpose of printing work in colours. The first colour was printed in the machine, and when finished, the stone was lifted and cleaned with the "Rapid" in about seven minutes. The transfer of the next colour was put down, and in an incredibly short space of time the stone was replaced and set running upon the second colour. When that was finished, it was again cleaned, another colour put down, and for the third time replaced in the machine to be as successfully run off as the previous two colours. Such an experiment proved the efficacy of the material, and shewed how much time could be saved in setting by using the same stone for each colour.

Another test was to remove work from a stone which had been drawn seven years ago, and used as an experimental stone on several subsequent occasions. This was done so effectually that the strongest soft plate ink could not bring up any portion of the original drawing.

A further demonstration was to efface by the "Rapid," drawings which had been transferred from chalk paper seven years ago, and been allowed to get into a bad state by accumulations of thick ink dried upon the surface. After removal, a fine transfer was put upon the surface, and proved to be quite clear from any trace of the old work.

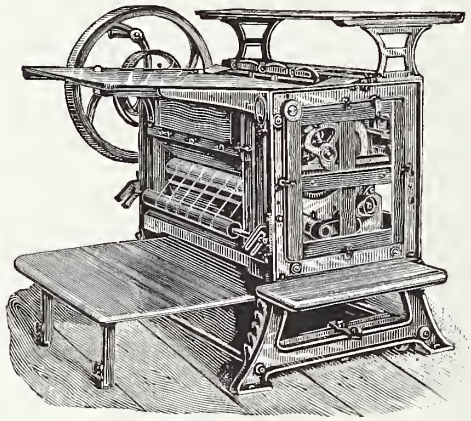
These operations were all performed in very brief periods, varying, so far as "polishing" was concerned, from four to seven minutes. It might be added that the washing out of the work was materially assisted by the use of "Izal" mixed with the turpentine.

On the point of cost, it is necessary to gauge it upon such a quantity as a cask, the price of which shews that a gallon costs 7/6. In use, 4-oz. have been enough to clean some six demy stones, or an average expenditure per stone of $\frac{2}{3}$-oz. Since one gallon contains about 160-oz., the six stones cost one-fortieth of 7/6, or about 2¼d. This is taking a very economical view of it, and one which could scarcely be expected in the general whirl and waste of lithographic rooms; but one penny per demy stone may be considered as a fair average cost. The value of the material depends upon its proper use, and cannot be estimated upon a merely cursory operation.

International Trade in Printing Machinery.

To advanced lithographic printers everywhere the name of the firm of Schmiers, Werner and Stein, Leipzig, is a name to conjure with as regards printing machinery, and—to no demerit of British makers—it may be safely said that the enterprise and perseverance of the Leipzig firm have fully merited the wide support received. In October of this year, Messrs. Schmiers, Werner & Stein celebrated the twenty-fifth anniversary of the foundation of their business, and the interesting event has naturally attracted much attention in the trade, besides calling forth much information relating to the well-known engineers.

The business was founded in October, 1869, which occasion in one sense was auspicious—from the fact that the contemplated adoption of fast running machines for lithographic printing opened out vast possibilities for new machinery. On the other hand, the war year—1870-1—which followed, brought disaster to commercial houses throughout the country, and the new firm naturally suffered. As business grew more settled, however, lost time was regained, and a progressive business connection was quickly gathered together. Ever increasing their facilities, and putting the very best into their machinery, their name soon became synonymous with first-class work and modern development. The first machines were adapted for best chromo work, bank note, phototype, and transparent printing, at a high rate of speed. About nineteen years ago, to these were added collotype machines, which further added to their reputation and assisted largely to earn the world-wide fame the firm now possesses. This was followed by a series of fast presses for litho and letterpress work, and afterwards by new bronzing machines. The restless enterprise characterising the firm led them to make constant developments, eventually leading up to machinery for metal plate printing, and at the present time their machines for metal plate printing possess a well-deserved popularity. Multi-colour machines for working on tin direct can be applied for any number of colours, and are specially fitted with double impression cylinder. For good work, on various metal advertisement plates, these machines are said to receive general preference.

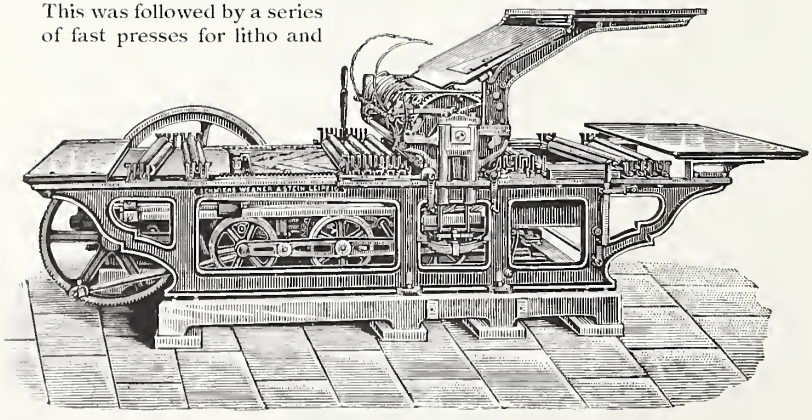


Bronzing Machine.

Collotype machines have long formed a speciality, and their continued use testifies to the satisfaction they give printers. Changes are being continually made in these machines, consequent on improvements in printing methods, and the firm guarantee to send out the most capable and effective machines of their class.

We give an illustration of one of the bronzing machines, which are made in four sizes, and specially adapted for uniform coating, thorough burnishing, and economical working.

After long trials, Messrs. Schmiers, Werner & Stein have succeeded in adapting their fast litho presses for printing on china or glass, through the medium of collodion fibre or paper which process had hitherto been done with hand presses. It is claimed that one of the fast presses attended by one man, does the work of nine to ten hand presses requiring as many men.



Collotype Printing Machine.

New premises early became necessary, and in 1872 the works were removed from Turnerstrasse to far larger premises at Dösener Weg, 12-14, from which machines are exported to all parts of the world. Machines have been sent to all European countries, the United States, China, Japan, and all civilised centres. Some of the latest shipments have been to Antwerp, Moscow, Odessa, Tourmont, Stockholm, Bombay, St. Petersburg, and many are now on order for firms in London, New York, Canada, etc. The firm claim that their success is due not only to the ordinary advertising they have done, but to that best of advertisement—the recommendation of good work. For some years after their inauguration the house shewed machines at various exhibitions, and invariably with the highest success, and while they now discountenance this form of advertising, the innumerable testimonials received testify, if necessary, to the estimation in which their machines are held throughout the printing world.

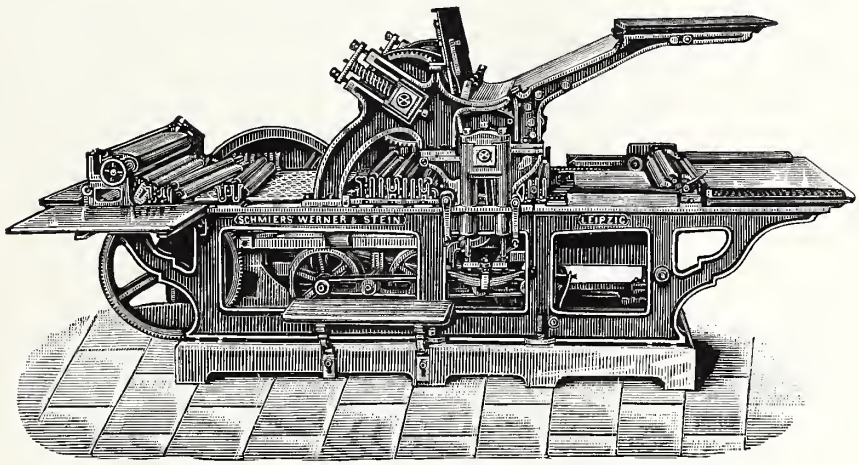
Such successful enterprise fully warrants the celebration of a jubilee, and the firm are to be congratulated on the position they have attained.

We understand that the firm are so busy that their staff is being largely increased, and in each of the specialities—collotype, tin-printing, bronzing, and ordinary litho machines—pressure of business is reported. Eleven machines are now on order for England alone, and for the next six months the works will be maintained busy on orders in hand.

As affording some idea of the output of the firm, we are informed that Messrs. Schmiers, Werner and Stein have made and supplied over 1,500 litho and collotype machines, nearly 100 direct tin-printing machines, and over 300 bronzing machines.

The above particulars of the famous Leipzig firm will doubtless be received with much interest by printers, and we are pleased to have, at last, the opportunity of presenting them to readers. We have frequently been asked to say something about the firm and their productions, but space and opportunities are alike very limited.

The sole agents for England and the colonies are F. Kühn & Co., 65 and 66 Basinghall-street, London, E.C., who will be pleased to give further particulars.



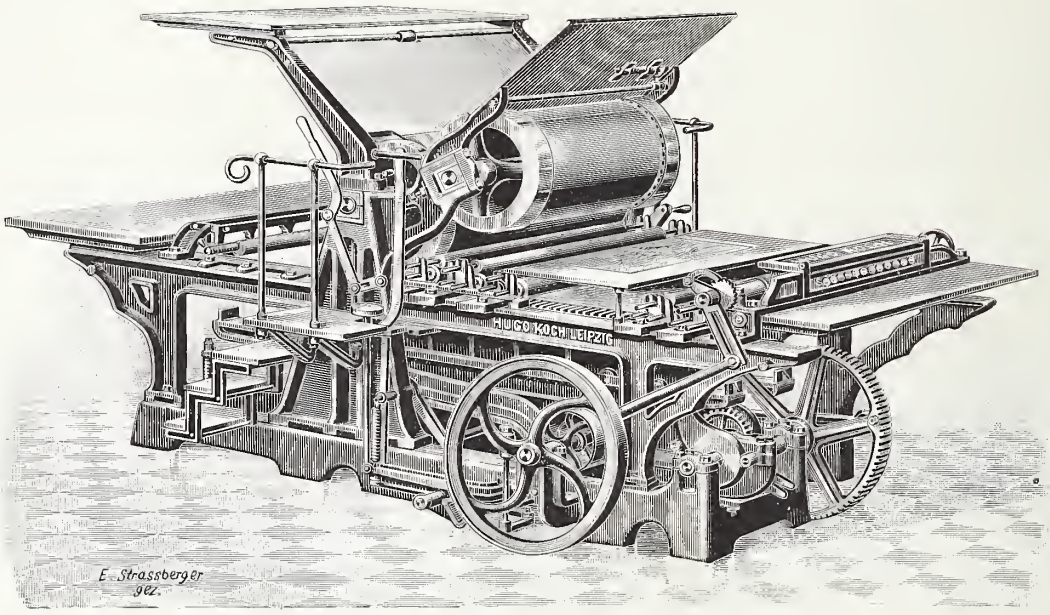
Two-Cylinder Machine for Printing on Tin Direct.

Madder Lakes were, until a recent period, entirely made abroad, and as they are of a somewhat complicated chemical formula, very few of the English manufacturers have succeeded in producing them equal to the foreign article. The firm of **Mander Brothers**, however, have given a large amount of time and attention to the subject, and are now producing madders of a colour, permanence, and printing quality fully equal to those of any foreign maker, and superior to much that is shipped to this country. Manders' madder lakes are distinguished by a light gravity, a very beautiful clean fracture, softness in grinding, and great tinctorial power. When made into ink they are suitable for the finest work, both letterpress and litho, and are susceptible of endless alteration when mixed with other colours. Messrs. Mander have brought out four distinct shades, which are represented in the inset shewn with this issue; but we understand that they are producing several new and beautiful varieties, including a very deep, powerful crimson, a new rose, a violet, and a very fast green madder.

Madders, as is well known, are very permanent in sunlight, although Messrs. Mander prefer the word "fast," as they say "permanent" means

everlasting, which no colour can be under all circumstances. Their madders are, however, particularly fast in light, even when reduced to a tint. These colours also possess two important characteristics of much consequence to the printer. We refer to their being less affected by acids and alkalies than ordinary colours, and to the fact that they do not wash on the stone. In fact, the madders made by this firm are so fast to water, that if boiled in it for twenty-four hours not a particle of colour will be extracted from them, nor will the water receive the slightest stain. The whole of these colours are varnishable with spirit varnish.

It is quite evident to us that the wonderful success achieved by this firm as printing ink makers is partly attributable to the industry, thoroughness, and ability which they have brought to bear in the manufacture of fine ink colours.



TIN PLATE PRINTING PRESS, WITH TWO IMPRESSION CYLINDERS OF SAME SIZE.

MANY lithographers in the British Isles have met with the litho and collotype machines made by **Hugo Koch**, Leipzig-Connewitz, and in journals circulating throughout the world's trade centres the firm's advertisement is regularly to be seen. The firm's latest catalogue—a handsome production—is an indication of the extent and importance of the machinery it manufactures, over fifty pages setting forth illustrations, sizes, prices, description and testimonials of the machines.

We regret the blocks for illustration are almost all much too large for use in our pages, but we shew a tin-plate printing machine as a specimen of its class. Amongst the machines specified are lithographic, collotype, and tin-plate printing presses, bronzing machines, and stone planing machines. The "rapid" litho presses may be obtained in sizes to take stones from 24¾ × 33½-in. to 35 × 47-in. Another series take from 43 × 51-in. to 49 × 69-in. There are also "rapid" litho jobbing machines — "Lightning" presses. These are specially intended for chromo work and for printing long numbers. As with the firm's other machines, the polished parts are nickeled. A set of litho presses—Nos. 1 to 4—may be obtained adapted for either hand or power, and side and back views of the presses are shewn in their list.

A capital collotype print shews one of the collotype presses, which are made in four sizes, the extra length of cylinder allowing large sizes of paper to be used on small presses. The two series of tin-plate printing presses are also made in four sizes; the first is furnished with one large and one small impression cylinder, and the other with two impression cylinders of the same size. Another speciality is a patent bronzing machine made in six sizes. A very large number of excellent testimonials from houses in all parts of the world attest the efficiency of the machines and appliances sent from Hugo Koch's establishment. Extensive premises, fitted with the electric light, and a large staff of competent workmen, enable a large export trade to be catered for, and we understand that a very large business is thus done.

The Arms of the Boroughs & Towns of Great Britain.

Containing various points of note for the artist on the ART of BLAZON.

Eastbourne. M.B.

Sussex. 34.977.

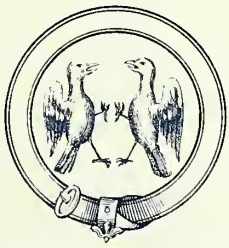
Doncaster. M.B.

Yorkshire. 25.936.

East Stonehouse. U.S.

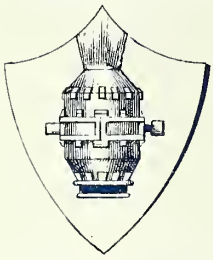
Devonshire. 15.502.

East Retford. M.B.



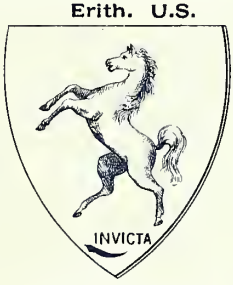
Nottinghamshire. 10.603.

Eston. U.S.



Yorkshire. 10.695.

Erith. U.S.



Kent. 13.411.

Evesham. M.B.

Worcestershire. 5.836.

Stockton-on-Tees. M.B.

Durham. 49.731.

Salford. C.B.

Lancashire. 198.136.

Leicester. C.B.

Leicestershire. 142.051.

Exeter. C.B.

Devonshire. 37.580.

Daventry. M.B.

Northamptonshire. 39.39.

Prize Competitions.

Florist's Card.

The number of competitive designs does not leave much choice as to which is the best that can be done. Of the designs sent in, the best is by:—

Mr. Peter Cheyne,
3 Milton-street, Abbeyhill,
Edinburgh.

In it there is a grace of line and treatment much superior to the second design by "T.J.C.," whose card is well carried out, very emblematical, but scarcely so graceful as the above.

The design by "R.C.H." contains some excellent ideas. It is, however, much better suited as a fruiterer's card, rather than a florist's. In some respects the working out is highly effective; whilst there is a lack of accuracy in the drawing, and in the main it would form a very heavy and unpresentable block by the zincograph process.

Competitive Designs.

In offering a money prize for designs, it is hoped that many artists will take advantage of the offer as a means of self-improvement, and improvement to the whole trade. We have frequently heard it remarked that there are many artists who are quite willing to send sketches to the journal, gratis, for publication. So far, those artists have not done so; and now that a partial remuneration is offered, these same artists do not come forward in the competition. Why should there be this reluctance? If anyone takes up a copy of *The Studio*, he may find there numerous illustrations of the competitive designs sent in every month for various purposes. Quite recently there was a competition for a design for a menu, and on examining all the designs, it can be safely said that with the exception of the first prize, the whole set did not contain designs as good as those sent for our own menu design competition of some two months ago. But, whilst lithographic and copper-plate artists are neglecting this method of self culture, amateur artists in all parts of the country are doing their best to get on even terms with our profession, and send in designs of various kinds, at a cheap rate, which cannot be competed against in the profession itself. To maintain their position, artists must shew that they can do the work, and not allow school of art amateurs to step in and take a considerable portion of their daily earnings. Over and above this means of exhibiting the skill of the profession, other means present themselves. Next year there will be another Arts and Crafts Exhibition in Manchester, when artists should submit some of their very finest ideas, both in competition for the medals and for the possibility of sale at the exhibition. As mentioned on another page, no charge will be made for space, and applications should be made to the Curator of the City Art Gallery, Manchester.

1. "CLIMAX" writes his essay from the standpoint of a machine-minder, without much regard for the machine itself. His essay certainly appeals to the majority of machine-minders, and touches on those points which are the most likely to occur first in their experience.

2. "PATRIA" in all probability could have written in the same strain as "Climax," and with as good effect; but he has chosen to deal almost entirely with the possibilities of difficulty arising from the machine itself, and has suggested many valuable considerations.

3. "THROSTLE" writes a fair, intelligible essay, and such points as he touches upon are well handled. But the work is too special, leaving out a number of particular features in machine management which cannot well be overlooked.

4. "ALBEIT" treats the subject more from the standpoint of the manager of a machine-room, and devotes much of his essay to the preparation of the work by the transferrer, etc., as a means of assisting the machine-minder to perform his work rapidly and well.

[Want of space prevents the publication of the Prize Essay in this issue.]

COMPETITION G.—We offer a prize of

ONE GUINEA

for the best design suitable for a

PRIVATE NEW YEAR'S CARD.

The design to be in black ink on white card, and not to exceed 6×4-in. The design to be drawn in a manner suitable for zinco reduction to about one-third size of sketch.

COMPETITION H.—We offer a prize of

ONE GUINEA

for the best essay on the subject,

"MANAGEMENT OF A MACHINE ROOM."

RULES.

1.—The essay must not exceed 1,000 words (the longest essay will *not* necessarily secure a prize).

2.—All papers and designs may be signed with a *nom de plume*, but the correct name and address of each competitor must accompany each paper or design submitted.

3.—All papers and designs for competition must arrive on or before Monday, January 7th, 1895. The award will be published in the February-March issue.

4.—Competitors should address essays and designs for competition to The Editor, BRITISH LITHOGRAPHER, De Montfort Press, Leicester, and envelopes should be marked "Prize Competition" in the top left-hand corner.

5.—The decision of the Editor must be final.

6.—The Editor reserves to himself the right to publish any essay or reproduce any design sent in as worthy of mention besides the successful paper or design.

7.—The Editor cannot hold himself responsible for the return of unsuccessful papers or designs.

NOTE TO COMPETITORS.—Essays must be written on one side of the paper only.

General Labour Report.

THE stir in electioneering circles, as regards Registers, Town and City Council, Parish Council, Guardians, and School Board Elections, has been the means of a great increase of work in the printing trade which has brought the percentage of unemployed down to 6·5 in September, and 5·1 in October.

Now that the rush is over, a return to the old state of affairs may be expected. Similarly, the great pressure upon lithography for the production of almanacs and presentation plates is released, and will tend to again increase the number of unemployed amongst both artists and printers.

Taking the separate industrial districts, the state of trade in October may be summarised briefly, as follows:—

ABERDEEN.—Letterpress worse, ten per cent. unemployed. Lithographers improving.
BELFAST.—Letterpress dull. Lithographers and artists fair.
BARROW.—Printing trade bad. Short time in some cases.
BIRMINGHAM.—Printing trade generally well employed.
BOLTON.—Lithography improving. Letterpress, no change.
BRADFORD.—Printing generally quiet. Lithographers only busy on special work.
BRISTOL.—Letterpress good. Lithography improving. Bookbinding dull.
BATH.—Printing trade depressed.
BURNLEY.—Letterpress good by reason of elections.
CARDIFF.—Printing trade busy.
CORK.—Letterpress and bookbinders shew improvement.
DERBYSHIRE.—Letterpress quiet. Lithographers twelve per cent. unemployed. Bookbinders two per cent. unemployed.
DUBLIN.—Printing trade has improved in all other branches than letterpress.
EASTERN COUNTIES.—Printing trade busy on election and register work.
EDINBURGH.—Letterpress bad. Lithographers good. Bookbinders improving.
GLASGOW.—Letterpress bad. Lithographers improving.
HANLEY.—Letterpress, position maintained. Lithographers, no change.
HULL.—Printing trade good.
LEEDS.—Letterpress slightly improved. Lithographers busy.
LEICESTER.—Letterpress and lithographers have about ten per cent. unemployed.
LIVERPOOL.—Letterpress improved. Lithographers steady.
MANCHESTER.—Letterpress bad. Lithographers slight improvement.
MIDDLESBROUGH, ETC.—Printing trade generally busy.
NEWCASTLE.—Printing trade steady in all branches.
NOTTINGHAM.—Letterpress fair. Lithographers improved. Bookbinders fairly busy.
PLYMOUTH.—Printing trade quiet.
SHEFFIELD.—Letterpress improved, but still five per cent. unemployed. Bookbinders fairly busy.
WOLVERHAMPTON.—Letterpress only busy on election work.

As is customary on the approach of winter the great army of unemployed gets stronger, and during October on one single day there were 315,277 paupers relieved by parish officers. It is to be feared that this only represents but a small section of our almost destitute countrymen, whose means of subsistence are reduced to the lowest possible level.

Trade Reports.

OUR Dublin correspondent unburdens his soul concerning trade matters in the Hibernian capital, and as probably expressing the opinions of lithographers in the sister isle, we quote from his letter :—

"The litho trade here is very dull indeed, and has been for some time, nevertheless, 'Printed in Germany' is constantly seen on showcards, etc., of our local tradesmen. If talent were absent there might be an excuse. But I'm confident that we can compare favourably with any other city in the manner we turn out our work. The recent competition for a trade mark design for Peterson's Patent Pipe resulted in many clever devices, the first prize falling to Mr. Thomas Finnigan, and the second to Miss Jacob. The latter is a lady of exceptional talent, and shares with a Miss Webb the honour of furnishing many prize designs for lace making, etc. Miss Webb works all her own designs into the manufactured article, and Miss Jacob lithos whatever designs she makes. Both ladies are pupils of Mr. James Brennan, R.H.H., Science and Art Department, whose name is to be found in every undertaking that can benefit directly or otherwise the citizens of Dublin.

"There is a probability of brisker trade in the litho work, as preparations are being made already for 'Ierne'—the coming show for '95—to be held in the same place, and even on a grander scale than 'Araby,' of present year renown.—EBLANA."

DERBY.

AN improvement is to be chronicled in the lithographic offices. Only a few week ago a large number of lithographers were working on short time, now a great majority have returned to full time. The Society reports three members as still unemployed.

MR. JAMES PEACH, of Brook-street Printing Works, was re-elected, unopposed, to the Town Council, at the recent elections.

EDINBURGH.

TRADE in Edinburgh and district is very good at present, only two per cent. of Society members being unemployed.

THE Litho Technical Class was opened for the session 1894-95 at the Heriot-Watt College on Tuesday evening, October 23rd, 1894. Principal F. Grant Ogilvie formally introduced the lecturer, Mr. D. Cumming, of Messrs. McLagan & Cumming, and made several remarks as to the objects and proposed work of the class. The meeting being the introductory one was free, and was largely attended by the trade, about 150 being present. Mr. D. Cumming, the teacher of the class, gave a highly interesting and instructive lecture on the discovery of lithography by Aloys Senefelder, and traced the growth of the art with special reference to this city, shewing the different classes of work produced by making reference to books kindly lent from the Free Library, and by specimens exhibited in the lecture room, most of which were the work of Messrs. McLagan & Cumming. The class meets every Tuesday at 8 p.m., and is expected to be of great benefit to the trade, and particularly the apprentices. Several employers have supplied their apprentices with free tickets for the class. The fees are 5/- for the session, and there are about ninety on the roll. Prizes will be given to journeymen and apprentices for best work done in connection with the class. Demonstrations take place at each lecture, Messrs. Furnival and Co. having supplied the hand-press; Messrs. A. B. Fleming & Co., Granton, a whole outfit of coloured inks, with varnishes, etc.; The Hull Patent Zinc Plate Co., a number of plates and necessary chemicals; and Messrs. Shackell Edwards some inks and varnish.

Professor Stanfield, of the Heriot-Watt College, gave an instructive lecture on machine construction, shewing models, etc., on Tuesday, Nov. 20th. A working model of stone-grinding machine was also shewn by Mr. Cochrane, Edinburgh; and drawings by Messrs. Seggie of their stone-grinding machine.

* * * * *

Answers to Correspondents.

IN reply to Mr. Pringle, who very naturally comments upon our decision in not making the award on the last essay competition, we can say that we acted in that way in all good faith. We can assure him that if the competition had elicited any trenchant remarks or opinions, which would have carried the least conviction home to the majority of journeymen and the apprentices in the trade as to "Why Lithographers should be Photographers," we should gladly have published them in full. But it was not the case, as the matter sent in for competition did not bring out the reasons at all. At a later date we shall in all probability again set the matter for competition, when we hope that those who competed this time, as well as others, will see their way to try to explain in a brief essay the real necessity for a lithographer to be also a photographer. We did not wish for any essay to describe how a lithographer may become a photographer, but rather, why the great extension of the business necessitates a lithographer being well versed in all the technique of photography. We are sure that with this explanation the recent competitors will see what a wide field there was for a really good essay.

"S. & SON" ask for usual way of printing off ordinary run of commercial litho work. If work

is done on large or small machine, and should we recommend a folio-demy machine.

To put the whole matter—as regards commercial work—into a nutshell, it is better to get a machine of good size and work as many on sheet as possible; in fact, full sheet is the rule. You would find a demy machine suit the work better than a folio-demy, as you would thus get an increase in the number of jobs worked, with the same rate of speed as the smaller sized machines. The demy-folio would probably prove too small, and, in fact, the demy will be none too large.

CHINA DECORATION.—A correspondent refers to the extent in which lithography is being used in the potting and china trade, and asks for information on the lithographing of transfer pictures for transferring on to earthenware.

The process referred to by our enquirer is almost wholly appropriated by potteries, particularly in one section of the French trade, and requires a special plant. Such a plant includes litho and copperplate presses for pulling transfers, special transfer paper, and special mineral colours made up into inks, this being necessary for the glazing and burning of the transfers after transference to the "biscuit."

MESSRS. KLIMSCH & CO., Frankfort-a-M.—*re* B.L. 16—are advised to communicate with Messrs. Penrose, whose announcement will be found on another page. The Burdick Air Brush can be obtained complete for £6 10s., and Messrs. Penrose offer to supply at this price less 5 % cash.

IN reply to Mr. Evans, of Dundee, we are quite at one with his expressions, and we do hope that men in the trade will avail themselves of the opportunities we are constantly holding out to them, by writing short articles on any subject which is of interest to the trade in general.

"R.T.W.," who asks for the best method of washing "powder colours," is advised to obtain the "colours for dusting" from the colour makers (see B.L. advertisement pages). The method is purely a manufacturers' process.

As will be seen by the imprint to one of our supplements, **Mr. E. T. D. Stevens**, Hotel-street, Leicester, is again represented in our illustrations. We have seen a large number of his designs for typo and litho reproduction, and can attest the fecundity of ideas shewn, and the pleasing results he has produced. As a trade artist and typographic designer he has made wonderful progress, and may be relied upon to produce designs appropriate to all classes of work.

THE pretty **Village Scene** shewn in monochrome is from a pen and ink sketch by Mr. Stevens.

A CONTINUATION of the **Arms Supplements** contains a further contribution to this useful series.

Correspondence.

Headingley, Leeds, *October 17th, 1894.*

To the Editor of THE BRITISH LITHOGRAPHER.

DEAR SIR,—I notice in the letter in the current issue of the B.L., signed by Arnold Bros., the makers of the "Rapid" Solution for Polishing Stones, in *re* my criticism of that article, that *now* they direct that the stone should be rubbed with pumice stone in the usual way, "to get the etched surface off." In previous directions nothing was said as to the need for using *any* of the ordinary polishing stones; but if the pumice stone must be used in the ordinary way prior to the use of the "Rapid," I can't see where the gain comes in, except in "time" when a man is constantly employed in polishing stones. The number of operations is the same as shewn in table, and the cost of turpentine and "Rapid" is certainly greater than the value of the snakestone worn away in the ordinary mode.

ORDINARY WAY.	WITH "RAPID."
1. Polish work out well with pumice stone.	1. Wash work out well with turpentine.
2. Polish out scratches with snakestone.	2. Polish off surface with pumice stone.
3. "Finish" by using snake-stone lightly or by using a finer grained stone.	3. Polish with the "Rapid."

I remain, yours truly,
H. E. GRANTHAM.

Dundee, *October 12th, 1894.*

To the Editor of THE BRITISH LITHOGRAPHER.

DEAR SIR,—I am pleased to see in last issue that you are to give a prize for the best essay on machine management. If you could only give over a page in every issue for this important subject, I am sure it will be greatly appreciated by machine minders in general. Wishing you every success in your splendid production,

I remain, yours faithfully,
JOS. G. EVANS.

VOL. IV.—NO. 21. FEBRUARY-MARCH, 1895. PRICE EIGHTPENCE.

ISSUED EVERY OTHER MONTH, ABOUT THE END OF SEPTEMBER, NOVEMBER, JANUARY, MARCH, MAY, AND JULY.
SIX NUMBERS FOR 4/- YEARLY.
Foreign Subscription (post free) 5/- Yearly.

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INDEX TO MANUFACTURERS.

OUR SUPPLEMENTS

IN this issue include a chromo-litho label, "Fresh Lobster," which is offered as a suggestion for this class of label and general advertising work. The supplement is in nine workings, and amply demonstrates the value of Messrs. Mander Brothers' Inks—colour, depth, and easy working recommending them to the favour of lithographers. This supplement will rank alongside the "tomato label" presented with a recent issue, and will doubtless receive as much appreciation.

A REPRODUCTION of **Sketch in Black and White** shews a carefully-balanced and pleasing landscape. This sketch was executed on "process card," entirely in pen and ink, with light let in in places to emphasize particular portions—thus affording tone to an ordinary pen and ink sketch.

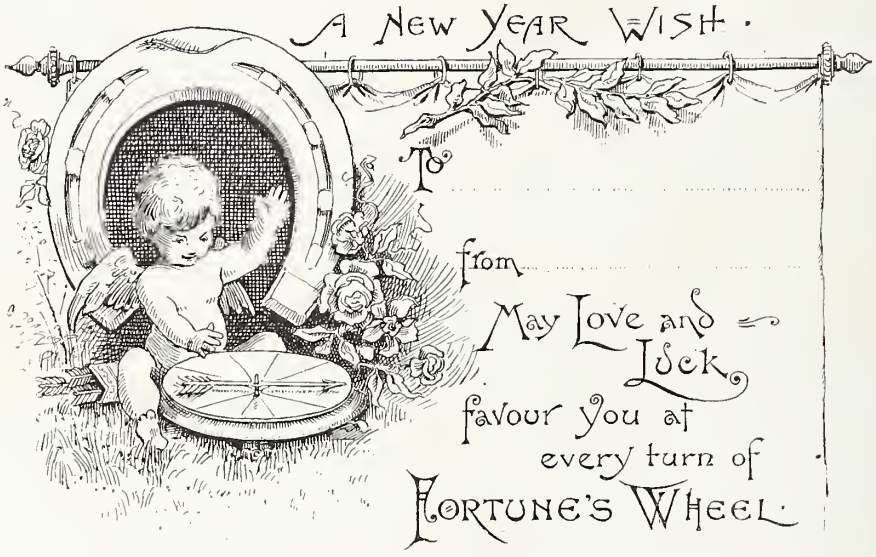
The Arms Supplement continues the series becoming so useful to the artist. This plate—the eleventh—contains twelve facsimiles of arms. Artists may rely upon the accuracy of these designs, for though we do not actually guarantee their truthfulness, they are, in every instance, redrawn from designs obtained direct from the place of origin.

The Trade Card announcing the business of Mr. E. T. D. Stevens, is interesting not only as a specimen of the designs he turns out with such facility, but as illustrative of a method he employs for obtaining the effect of steel or copper-plate work. This effect he has attained by his own methods, and so successful are the results achieved that, for general purposes, the work thus done is practically the same as steel-plate, while the cost is only about one-third.

The Three-Colour Printing Process.

SPECIMENS FROM GERMANY.

AMONGST the various trade almanacs before us there is one from the well-known ink makers, Berger & Wirth, of Leipzig. At the first glance it is in no way conspicuous, but that is not the point. The almanac is in itself most noteworthy, for it marks the beginning of the period when even trade advertisements from such important firms as ink makers are not produced by lithography, although the almanac has a fully coloured centre panel. It is this coloured panel to which our notice is directed. This same firm has a splendid lithographed advertisement for



PRIZE DESIGN—NEW YEAR CARD COMPETITION.

office use in some fourteen printings, and it is this picture which has been converted into three blocks by photography, and is here used in the almanac to produce the coloured centre-piece.

The firm has supplied us with copies from the original three blocks in their inks. The inks used are yellow (No. 1072), red (No. 1532), and blue (No. 842); and they have also sent us the result of the red and yellow printed together, as well as of all three blocks. These proofs are of course better than the panel in the almanac, and shew that, both as a photographic production and as a print, the whole process has advanced to a high state of excellence, it only being left for the hand of economy to step in to make it a really valuable and marketable method. This class of production has found its best exponent in THE BRITISH PRINTER, the specimens of three-colour work there shewn being most pleasing specimens.

Ornamenting Glass.

A DESIGN or inscription is first engraved on a printing plate, for which rubber is a suitable material; the design being engraved positively, that is to say, in the same way as that in which it will be afterwards seen. The plate is then coated with varnish colour and pressed upon a glass plate. The glass plate is strewed with bronze powder, sheet aluminium, or other suitable material, the portions forming the design or inscription remaining empty, and being, therefore, transparent. The glass plate is then placed in a frame having a backing of strong paper board, on the front face of which is mounted a brilliant sheet of tinfoil or tin plate, provided with prominent squares placed in suitable positions. The design is thus shewn by a brilliant reflected light visible through the transparent part of the glass, the other portion of the glass forming a backing stamped in relief.

Heretofore raised enamelled writing and designs in relief on glass have been produced by means of a brush and thin enamel paint. The inventor uses stencil plates, preferably of tinfoil or other flexible material, and a composition made of glass powder, made up to the consistency of treacle with turpentine and "glaze." The composition is applied with a spatula through the openings of the stencil plates, and the article is then fired. If the surface on which the design is to be produced is irregularly curved, or is curved both ways, the stencil is applied to sized paper, and the design is transferred from the damped paper to the glass or ware.—*Scientific American.*

Lithographic Artists' and Engravers' Society.

DINNER AT HANLEY.

PRESENTATION TO THE SECRETARY.

ON Friday, January 25th, one of the best gatherings that has yet taken place met at the Market Tavern, Hanley. The occasion was the annual dinner, and the proceedings were embellished by a well-earned testimonial of good friendship and esteem to the late secretary after discharging his duties for five consecutive years with praiseworthy efficiency and good judgment. The dinner was a first-rate spread, doing every credit to the purveyor. The feasting over, the guests settled down at about 8-45 p.m. to a long toast list. Amongst those present were the general secretary from Manchester, Mr. Banton (Typographical Society), Mr. Lloyd (Lithographic Printers' Society), Mr. Sherwin (Bookbinders' Society), and Messrs. Farrar, Clark, Tompkinson, Walton, and others, friends of the members of the branch.

Mr. Price (late secretary), president, opened the after-dinner speeches with a brief epitome of the year's work in the branch, shewing that the income had been up to the average, the expenditure had slightly increased owing to the annual auditors' expenses, and the savings of the branch had been very little less than usual. He continued his remarks with an earnest appeal to all members to look after the Society's business in every particular, to be united in action, and to foster amongst themselves a true spirit of brotherhood, and concluded with the customary toast of "The Queen," which was responded to with musical honours.

Mr. James Wright proposed the toast of the evening, "The Society," and in most gratifying terms coupled with the toast the name of the General Secretary.

The General Secretary responded at considerable length, going into several matters of detail which are closely attached to the internal workings of the Society. He spoke of the movement in London, which had its birth at the Hanley delegate meeting, and which had culminated on January 21st with the opening of a branch in London; and in referring to the new members in London, spoke of them as a body of earnest and steady trades unionists, who were not inclined to make their meetings the arena for political discussions, or use their funds for any other purposes than the legitimate objects of a society. In referring to the great scheme of superannuation, which was inaugurated on Jan. 1, he quoted the following interesting figures from the Report of the Labour Department:—

Total No. of Trade Societies having superannuation in 1892.	Total No. of members.	Amount paid in superannuation in 1892.	Total amount per head, reckoning all trade societies' membership.		
			1892	1891	1890
74	433,004	£106,552	1/9	1/9	2/-

PRINTING AND KINDRED TRADES' SOCIETIES.

	1891	1892
Number of Societies making returns	22	33
Total membership each year	36,402	42,259
Income per head	£1 10 4	£1 13 3
Expenditure per head on superannuation	£0 2 2	£0 2 4

Trades Societies making superannuation returns in 1892.	No. of Societies.	Total membership.	No. in receipt of superannuation in 1892.	Expenditure on superannuation in 1892.
Compositors and machine managers	3	22,681	297	£4,253
Lithographic printers	2	3,237	27	£448
Bookbinders	3	4,347	30	£206

And arguing from these figures that the scheme now started in connection with this Society, on the basis of an annual subscription of 4/4, is financially sound.

He then proceeded to give a large number of statistics, shewing the number of disputes which had taken place in England, France, Germany, Holland, Belgium, Austria, Switzerland, and the United States, and by such figures to disprove the allegation that strikes are driving the trade from the country—the real local depression of trade resulting from the increased power in all foreign countries to manufacture their own commodities, rather than having to import them all from England, and one or two other countries, as in times gone by. Referring more in detail to the results of the numerous disputes in this country during 1894, he shewed what large numbers of artisans had benefited by an increase of wages, or a reduction of hours.

Reverting to the work of the delegate meeting at Hanley in 1894, he said that the vote deciding that delegate meetings should be triennial carried with it two conclusions, viz.: that the members were satisfied with the arrangements and provisions of the rules for at least three years, and that the Society was quite satisfied with the administration of the rules by the Executive Council in Manchester. In conclusion, he spoke of the Society having certain ends in view when it started nine and a half years ago. Some of those objects had been gained, still leaving many to be fought out.

Mr. S. Banton (Typographical Society) moved the toast of "The Hanley Branch," and mentioned the fact that every eligible member of the craft was a member of the Branch.

Mr. H. Green (secretary) briefly responded, and Mr. A. Wood proposed the toast of "The Kindred Societies." In his remarks he referred to the printing trades in the Potteries as being a happy family; whilst firms were even vieing with one another for public notoriety by a dispute as to who was the first to give the employees the redress of

grievances, and advantages of employment, which had been claimed by the trade societies. The various delegates of the kindred societies—Messrs. Lloyd (Lithographers), Sherwin (Bookbinders), and Banton (Typographers) briefly responded, trusting that the same unity would continue in the printing trades as in the past.

Mr. C. Harrap then proposed the toast of "The Officers, past and present." He dwelt upon the question of finances of the Hanley Branch from 1885 to the end of 1894, and shewed that the Branch had been more economically managed than the average of the Society. In referring to its officers, he pointed out that their late secretary had held office for five consecutive years, being for length of office the fourth in the Society. In conclusion, he presented Mr. D. Price with a handsome cameo scarf pin and a silk umbrella, as a token of the esteem in which the members of the Branch had held him.

Mr. D. Price, who was taken by surprise, very briefly returned his thanks, and felt that what he had done had been for the benefit of all, as well as for himself, and he was deeply gratified to find that his endeavours had been appreciated.

Mr. F. Hall (treasurer) proposed the toast of "The Visitors," which was responded to by Messrs. Tompkinson and Walton.

Mr. Stanbra proposed "The Press"—whose representatives had just left the meeting—and Mr. S. Banton responded on their behalf.

The long pent-up conviviality now burst forth, and for the next two hours it was one constant stream of song. The programme—unavoidably broken by occasional absentees, who had to catch their trains—consisted of:—Piano selection, "Cavalleria Rusticana," Mr. Brayford; song, "The Nipper" *(Chevalier),* Mr. R. Hammersley; song, "The Storm Fiend," Mr. J. Wright; song, "Yeomen of the Guard—Heigh Day," and encore, "Awfully near it," Mr. F. Hall; duet, "Excelsior," Messrs. Swinnerton and Langton; song, "The Advertisement," Mr. H. Locksley; song, "The Monarch of the Woods," Mr. D. Price; song, "The Diver," Mr. Lloyd; recitation, "Doomed to Death," Mr. Jones; song, "The Skipper," Mr. Hinley; song, "Tommy Atkins," Mr. Swinnerton; song, "John Barleycorn," Mr. Langton; song, "Tom Bowling," Mr. Banton; song, "True till Death," and encore, "That is Love," Miss Massey.

Mr. R. Hammersley accompanied all the singers in excellent style, and all who took part reflect considerable credit upon the musical abilities of the district. This pleasant evening was brought to a close in the most agreeable manner by a well-deserved toast to the host.

The programme, being also menu and list of officers, was got up in first-class style, the design being from the hand of Mr. H. Green.

Society Notes.

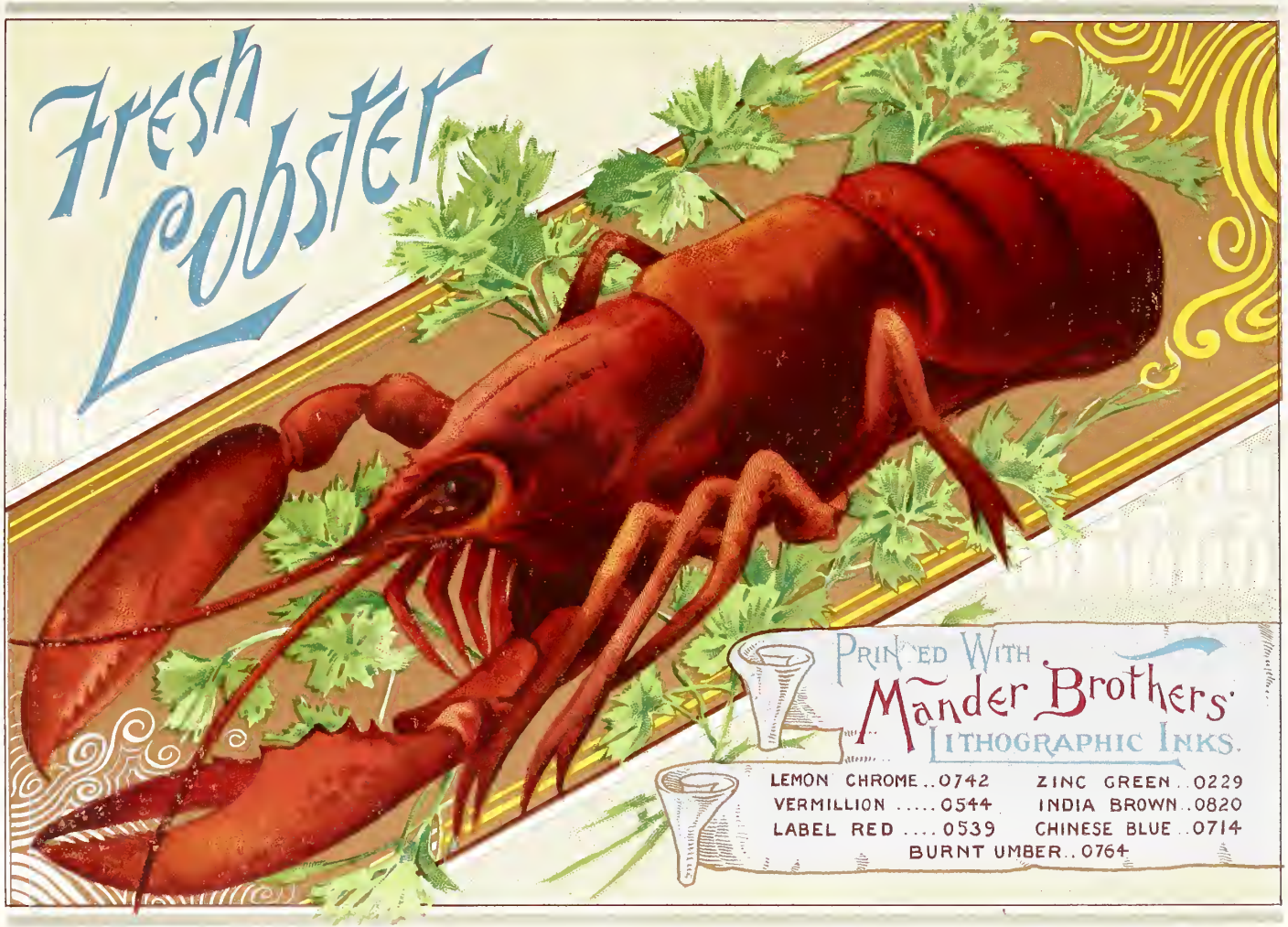
WITH THE ARTISTS.

AFTER a lapse of nine years of the most amicable relations between the Amalgamated Society of Lithographic Artists (Manchester) and the National Society of Artists (London), the time has come when the Amalgamated Society has been compelled to open a branch in London. The matter has been under consideration since last June, and has been carried into effect by deputy delegate meetings held in Manchester on September 22nd and January 19th. The branch itself, with some twenty-eight members, was started on January 21st, when the general secretary from Manchester was present. Although this course may appear hostile to the National Society, yet in its very conception and establishment there is a certain amount of sympathy from that Society, and the two Societies will continue to work in undiminished harmony.

THE National Society of Litho Artists has appointed Mr. Cecil Rea as art director of their classes. The work of this gentleman, who graduated in the Academy Schools in London, and in the studios of Courtois and Grasset in Paris, is well known in the Salon and the Academy; his appointment has already had an appreciable effect on the classes, both in the attendance and the quality of the work. The Society is also fortunate in securing the sympathy of Mr. Dudley Hardy, who has promised to visit the studios from time to time. This help will be appreciated more especially by those engaged in designing, which is to be one of the leading features in the programme, when settled down in the new quarters at Bolt-court.

THE Leeds branch of the Amalgamated Society of Artists held a first-rate smoking concert last year, bringing the year to a jovial conclusion. There were present some forty-one or forty-two friends, including Bradford members and the general secretary from Manchester. The evening passed off in the happiest possible manner, enlivened by songs, recitations, and instrumental performances. The very short time at the disposal of the meeting gave rise to a strong desire to have another such entertainment in a near future, and it was resolved to have a dinner on Feb. 23rd next.

AT Nottingham the branch of the Amalgamated Society of Artists held a smoking concert just before Christmas, and made it the occasion for presenting their energetic and untiring secretary, Mr. F. Ludwig, with an excellent silver snuff-box and cigarette-case, both articles being richly engraved, and inscribed with a suitable testimonial to the recipient.



Printed with Manders' Fast Lithographic Inks for Labels.

(FOR PRICES SEE LIST, SENT FREE ON APPLICATION).

The Revival of Lithography as an Artistic Process.

PERHAPS one of the best opportunities of regarding lithography has been offered in the views expressed by Mr. W. Rothenstein and Mr. Thos. R. Way, who have written short but pithy articles in *The Studio*, calling the attention of landscape and other artists, and etchers, to the possibilities of the lithographic stone and the admirable productions which can be obtained from it.

Mr. Rothenstein points out that early in the present century lithography was most ably used by Delacroix, and later by Gavanni and Honoré Daumier. But as the years rolled on the business became the slave of commercialism, and at the present time seems to be almost wholly devoted to fashion plates and grocers' almanacs. Such is his mode of expression, and we cannot altogether fall out with it. Of course, the intention of this writer must not be taken too literally, for he cannot have overlooked the reproduction by lithography of many fine paintings, nor the merits of some of the highly attractive posters on walls and hoardings. He could not also have forgotten the gems of lithography which are annually produced as presentation plates with Christmas numbers, as presentation and Christmas books and booklets, or as Christmas and New Year's cards. The point this writer seems to deplore is that, with such good examples in the past, the present "artist" ignores the value of lithography; and he goes on to shew that Manet only used lithography as a means to an end without a full appreciation of the resources of the art, whilst Daumier used the process with all the true vigour that can be obtained, and practised the art as a ready means for producing his caricatures, thus proving himself to be a brilliant lithographer. He further asserts that since the time of Goya no one has shewn a keener sense of the arrangement of masses of black and white. Fautin Latour shewed his power of using the possibilities of the art in his congruity of black and white, though there are some who will not or cannot appreciate the merits of his work. In more recent times, however, Mr. Whistler, of "nocturne" fame, has come to the front with his lithography, and has to some extent shewn the well-nigh inexhaustible beauty of this process on the stone. Mr. Rothenstein goes into ecstasies over the character of Mr. Whistler's work, and as lithographers we may take this revival of the artists' patronage as a sign of more stirring times in the lithographic world. Mr. Whistler has apparently been successful in his productions of colour work, yet he gives it as his theory that it is impossible to produce a good lithograph, except in black and white. Such a remark seems to have a strong bearing on the fact that lithographers who cannot draw, but who only work up a lot of colour stones in stipple and chalk, are not what he would call artists or true lithographers, but simply a species of mechanical draughtsmen who can only copy what they have before them without throwing into their work any genius or natural vigour, the possession of which would at once give them the right of being dubbed artists.

In drawing his conclusions as to the work which can be done by lithography, he refers to the lithographs published in *The Dial,* and a portfolio containing, amongst others, a portrait of Mr. Sturge Moore, all executed by Mr. C. H. Shannon, this gentleman's work shewing that he can use either the process of working up the surroundings in order to bring out his subject in partial white prominence, or working up the subject itself in pure chalk regardless of surroundings. Altogether, Mr. Shannon has shewn himself to be one of the most accomplished and scholarly lithographers of the day, standing almost alone in that position; whilst in France MM. Anquetin, Besnard, Toulouse, De Lautrec, and Bonnard, some of whose works were on exhibition at the Grafton Gallery last spring, are doing brilliant work. Of these, however, M. Anquetin alone shews that he knows the possibilities of the materials he uses; the other artists having, apparently, an idea that they can get more results in a different way than it is reasonable to expect. The majority of artists who are attempting the use of the stone are apt to ignore the difficulties of lithography, and try to compass them by means which are not applicable to the process.

In the main the foregoing remarks contain all Mr. Rothenstein's expressions, coupled with our own views concerning them. Following upon this gentleman's opinions, which are drawn entirely from the art side of the question, the matter is then dealt with by Mr. Thomas R. Way, who claims to be a practical

lithographer. In his remarks he opens by suggesting that artists should learn a little of the technicalities of the process, so that they will not be tempted to try methods which are impracticable. Mr. Way proceeds in a didactic way to speak of the nature of lithographic stone, the chalk, and the chemicals used for etching. On the latter point he sums up boldly by saying that no exact formula can be given for etching a drawing upon grained stone, and that the artist would act more wisely by handing over that process to a practical lithographer, than court continual failure by his own attempts to etch his work.

But the portion of his remarks which is of closer interest is a reference to the modes of drawing upon grained stone. He sets forth that there are three methods whereby excellent results can be obtained, viz. :—

First, the ordinary point work, in which chalks of all degrees of hardness may be used, quoting as examples of this work the drawings of early lithographic artists, such as S. Prout, Louis Haghe, R. J. Lane, A.R.A., coupled with the more recent productions which have been given as supplements to *The Studio,* by Mr. Macbeth and Mr. Whistler. The two latter examples are undoubtedly, as original drawings, worth more than a passing consideration; but we must be pardoned saying that there are many lithographic artists who would have produced these drawings with far greater vigour, and there are not a few who could have equalled if not excelled even the originality of these works. We say this in all deference to the artists named, but simply to shew them that they need not at present consider themselves, by any means, the only artists employed in producing lithographs.

The second method given by Mr. Way is by the use of rubbed tints, as supplementing point work; and in illustration he mentions the works produced fifty-four years ago—about 1840—by J. D. Harding, Eugene Isabey, and others, in which they used the stump as an aid to point work.

The third method he describes as litho-tint, in which absolute washes of litho ink of varying depths are applied to the grained stone, the lights being finally scraped out with a mezzotint knife. As examples of this method he cites the works of George Cattermole, Joseph Nash, and many others, also referring to the clever way in which Eugene Isabey combined all the three methods in one production, and to the half-dozen beautiful examples executed by Mr. Whistler only a few years ago.

Mr. Way also calls attention to the use of grained paper as another method of chalk lithography, and as examples refers to the productions by Mr. Whistler in the Grafton Gallery in the spring of 1894.

In conclusion he warns artists against attempting to either etch or print their own work, for he significantly remarks that they, too, would require to serve an apprenticeship to the trade before they knew how to do it. These remarks are only too true, and we might add that even the good old school of chalk transferrers, chalk etchers, and chalk printers, has almost shewn the same amount of decay as the lithographic art itself has done from the artists' point of view. Commercialism has played its part in this revolution, and the desire of the public for cheap pictorial illustration has driven the chalk artist as well as the pictorial wood engraver almost into the limbo of the past, supplanting their work by the now popular half-tone process and its beautiful sister process, collotype, by which photographic productions of the scenes of life and objects of nature as well as manufacture are produced in their true natural nakedness, rather than adorned by any of those tasteful little touches of the artist which lend grace and imagination to the efforts of their pencils.

Ballad of the Poster Artistic.

CRAZES and hobbies enough and to spare,
Our forbears have left us. Now, say, is it right
For leaders of taste a new cult to declare,
Exploiting new hobbies our greed to excite?
Postage stamps, book-plates, blue china, and quite
Dozens of things most æsthetic and mystic,
Pass for the moment away out of sight—
Now is the cult of the poster artistic.

A thing on the walls, brave in sun-laden air,
Is dragged within doors for our cultured delight;
Mounted and framed as if masterpiece rare,
Bought with much gold, after terrible fight.
So the collectors—although it be trite—
Declare that this fallacy sounds syllogistic:—
A placard's a beauty, though beauty's a fright—
Now is the cult of the poster artistic.

What can we do with them? treasure them, where?
Cupboards are full, and chests packed over tight,
Walls are all crowded, each table and chair
Piled up with rolls that disaster invite.
Well may a Philistine—cynical wight!—
Say "This is folly"—that's just euphemistic
For words he would use that should slaughter and smite—
Now is the cult of the poster artistic.

ENVOI.

Chêret, with fantasies dainty and bright,
Grasset with maidens a shade ritualistic—
Shall we collect them? we could if we might!
Now is the cult of the poster artistic.

—*Windsor Magazine.*

THERE is a great deal of solid wisdom in the reply of a successful manufacturer when asked why he patronised trade papers so largely, to the neglect of other methods of advertising. His reply was: "Men who do not read their trade papers and keep posted in their business are usually poor customers. If I sell them a good lot of machinery, they do not know how to use it and report a failure, or we have to run after them, lose time and money to get them agoing and make the sale stick. But those who read and are posted know how, and succeed."

Made in England or Abroad?

THE publication of Christmas cards and Christmas numbers has again turned attention to the amount of work of this class emanating from foreign sources. The *Morning* interviews with representative houses in the trade elicited much interesting information on this point, and this has been increased by correspondence in various journals. Complaining of the enormous amount of work done abroad for British publishers, a correspondent stated there were for sale in this country one million English Christmas supplements in five to eight colours, printed entirely in Holland and Nuremberg, and sold to the British public. In 1894 six millions of British Christmas cards were printed in Germany. The greatest offenders in this respect are said to be the religious societies. On the other hand, another correspondent draws attention to the fact that in 1894 a great deal more Christmas work was done in Great Britain than in 1893, and that the majority of our principal weeklies had their supplements printed at home. The great Olympia posters were almost all drawn and printed in this country.

Our recent notes on prominent manufacturing stationery houses prove that—in spite of the enormous importations of Christmas cards and general chromo work from abroad—the output of British houses is not only increasing in artistic value, but by leaps and bounds is taking a recognised place in the markets. As a matter of actual fact, we know that an immense number of Christmas cards, booklets, and various seasonable chromo novelties are being both designed and printed in this country. This, however gratifying, will be more satisfactory still when British productions become preferred to the foreign-made goods—a consummation we hope to see ere long. In design and printing, in taste and methods, British lithographers and printers need give place to none, and it is only the abominable craze for cheapness—the source of sweating and the author of scamped work—which sends much of the colour printing abroad.

It behoves British lithographers to take advantage of every opportunity of shewing their skill and making good the claims made for them.

A Well-known Firm of Lithographers.

A BULKY parcel of work produced by Messrs. Sprague & Co., lithographers, 4 and 5 East Harding-street, Fetter-lane, E.C., shews that this old-established firm possesses a large circle of customers, and does its sections of litho work in a most commendable manner. The firm was founded early in the fifties by the late Robert Winter Sprague, and after many years of successful and growing business it has passed into its present proprietorship, the widow of the founder and Mr. Alfred Fish, the latter having been for twenty-five years connected with the business. In 1886 the firm introduced a half-tone litho process, termed "ink photo." As a secret process it was worked entirely by themselves, but complying with the demand from the trade, they have now arranged to supply this process work, ready for printing, on customers' own stones. It reproduces with minute detail and half-tone value any article direct, or from an ordinary photograph, which for trade catalogues and design sheets is a great advantage, and, further, the originals can be returned within twenty-four hours in cases of urgency.

Among the trade journals, technical papers, and medical and architectural works which the firm illustrate may be noted the *Builder* and the *Architect*. Specimens shew the softness and character of a portrait, the clearness of detail and distance of depth desirable in buildings, and delicate pencil and water-colour drawings are reproduced in exact facsimile even to the graduated grey pencil tint on the strong patch of body colour. Examples of the now well-known cartoons published by the *Drapers' Record* and *Invention* shew how uniform the work appears with forty or fifty portraits on one sheet. This process is not confined to black or any one colour, and illustrations of carpets, mosaics, stained glass, and costumes, shew its value in this direction, and where a variety of tints is necessary, inasmuch as the texture of material or original touch of the artist is not lost, the process has an advantage over ordinary chromo work. It may be added that Messrs. Sprague & Co. have had great experience in showcards, and in photo-lithography their reputation stands enviably high.

The "E.R.A." Photo Block Co., for whom S. and Co. are agents, is an innovation to the trade. Having no cross-bar or hatched-line appearance, it is unlike any other; the grain is almost like a soft graduated stipple, producing pure half-tone with great depth of effect. It doubtless only requires to be known to be appreciated by the trade, especially the book trade.

Collotype for Non-Professionals.

THE increasing popularity of the collotype process for certain classes of reproduction renders some knowledge of the "light-printing" methods indispensable to all-round craftsmen, and almost invaluable to foremen and employers who have frequent dealings in illustrated work. The following simple yet wonderfully complete description of the collotype process is contributed to this year's volume of "The International Annual of Anthony's Photographic Bulletin"—a deservedly popular production—by Hy. Pickering:

"For two years past, the process known as collotype has engaged all the spare time I have had, either practical experiment or hard thinking, but by constant and persevering working I have at length arrived at such degree of perfection as gives me that pleasure in observing the results of my labour, which is only to be experienced when a passable result is arrived at after a long series of experiment and careful note. I have great pleasure in presenting a short description of the process and the *modus operandi* thereof. I may say in starting, that although perfectly at home with the chemical part of the process, I was quite a tyro at the practical or inking-up part, although I have chanced to come across one good old friend, who, also a photographer and worker in collotype, has, by a constant interchange of ideas and results, made the work more easy and congenial than if it was a solitary search; but I have on the one hand found that those who knew nothing of the process were willing enough to offer their suggestions and commence for themselves at the point where they left me; I have on the other hand discovered that those who knew anything of the process were particularly careful to keep it exceedingly snug, and therefore, as there was nothing to be got out of them, it behoved me to flounder. I have been handicapped considerably in knowing so little of the tricks and dodges of the printer, which are so necessary in the process; but even these dodges discover themselves to the patient worker, and if my process will give such gratifying results with the aid of a rubber roller squeegee for an inking roller, and a letter copying press for a printing press, I am quite sure that an experienced printer, with proper materials and apparatus at his command, will be able to turn out superior work.

"Now to proceed. The first requisite is a piece or pieces of ⅜ plate-glass, polished and without a scratch; these must be finely ground on one side by placing one piece on a sheet of paper, then about a teaspoonful of fine emery powder, and moistening it with water and rubbing it vigorously with the flat side of the other piece, renewing the emery as it feels to work smoothly and loses the bite. Be careful to grate the edges of the glasses together, before commencing, so as to take off the sharp cutting edges, or lacerated fingers will be the consequence; then, when equally ground all over, wash well under the tap to remove every particle of emery, and dry before the fire. The next thing to be done is to prepare the substratum, which is very necessary, to retain the subsequent gelatine film on the glass. This is made as follows:

"White of one egg is well beaten to a froth and allowed to subside and filtered through cotton wool, then add water ten ounces, and silicate of soda one ounce. This must be well shaken and poured from one vessel to another to liberate every atom of gas; now take the glass plates, wash in water, and pour over the surface a small quantity of the albumen compound, and off at one end; repeat the process and pour off at the opposite end and allow the used liquid to escape. Dry this before the fire. Any number of plates may be thus prepared, as they will keep indefinitely; now prepare the sensitising fluid as follows:

Bichromate of ammonia	30 grains.
Gelatine	1 ounce.
Water	10 ounces.

and dissolve by heat and filter.

"Level the glass plate and pour on a plate 4 × 3-in. half an ounce of this and allow to set, then place in the drying cupboard to dry; of course, half a dozen or any number may be prepared, but the sensitised plates will not keep more than a week. When dry, print under a good plucky negative, with a shaped mat between to provide a 'safe edge' and thus prevent the edges of the negative 'taking ink,' allowing twice the time to print you would the same negative in silver. When printed, soak the chrome negative in water until all the unaltered bichromate is washed out, using fresh water as soon as the previous washing becomes a deep yellow, and until the whites of the negative are perfectly free from the yellow tinge of the sensitiser; then dry the negative, or *cliché* as it is termed, not using any artificial heat. Now to

print, soak the negative or *cliché* in a solution composed of equal parts of glycerine and water for an hour; take out, drain and remove the superfluous moisture with blotting paper, and proceed to ink-up, using an india-rubber roller and a very sparing supply of ink, which should be the very best litho ink procurable, when the image soon begins to be apparent and steadily builds up in the manner of developing a properly timed negative. Then place a piece of glazed paper over the image, and insert in the press and give a steady pressure, and on taking it out the print in printer's ink will be found more or less perfect. After a few inkings-up it will gradually assume the condition of a perfect print, and will give satisfaction if the details are properly carried out. One or two things require to be borne in mind. The plates must not be dried at too great heat—100° or 110° is the proper heat—and the *clichés* must be damped with the glycerine liquid between every six impressions or so; if not the whites take ink. The amount of ink must be sparingly distributed. Above all, do not expect proficiency in the first attempt, and beyond even that, do not be discouraged at failures, for you will have plenty, but stick to it; when a fault appears, work at it until that fault is remedied, and master them one by one, and you will enjoy the infinite satisfaction of finding yourself able to produce any quantity of good prints at a minimum of cost."

By permission of Messrs. Grogan Bros., Torquay.] TWILIGHT IN TORBAY.

A MOST instructive lecture dealing with "The Causes of Unemployment," was recently delivered at the Borough Polytechnic Institute, by Mr. John A. Hobson, M.A. He said, "The real cause of unemployment was due to the fluctuations in trade, and to the fact that there were many trades upon which the workman relied for his living which were "fashion" or "weather" trades. There was another reason—commercial credit, which in the final report of the Labour Commission was stated to be the chief cause of unemployment. It was interesting to know from Government statistics that from 1887 to 1893 there were, at certain periods, one per cent. of workers in skilled trades unemployed, while at another time the number increased to nine and ten per cent., the average being 5·8 per cent.

IT is complained that the omission of the words "engraving" and "etching" from the present American Copyright Law is a serious injury to the photo-engraver's business—that is, of course, in the United States.

WOOD engravers and lovers of good wood engraving will note the following announcement in the January *Century* with satisfaction:—"At a time when the tendency of the magazines is toward the various cheap processes for the reproduction of works of art, the *Century* proposes to continue to employ Mr. Cole's graver upon this important artistic enterprise, as well as to give examples of wood engraving by other leading representatives of the art in America."

A COLOURLESS varnish, made by passing a current of electricity through purified linseed oil containing an admixture of sulphuric acid, has been made the subject of a patent by a German chemist. The electrolyzing process is continued for two or three hours, and meanwhile the oxygen, as it is set free from the H_2SO_4, converts the oil into varnish.

Technical Education.

THE *London Technical Education Gazette,* the official circular of the Technical Education Board of the London County Council, contains various extracts from letters relating to the Trade Conferences held in 1894. These letters were received in reply to communications addressed to well-known employers by Mr. H. J. Powell, L.C.C., a member of the Board. Amongst them are expressions of opinion from representative printing houses, and the following are quoted as being, at the least, instructive :—

Messrs. Marcus Ward & Co., Ltd., wrote:—"We are of opinion that special instruction in the various methods of lithography, chalk, stipple, use of Day's shading mediums, etc., and also special instruction in lithographic colour printing, would be most useful to (*a*) boys and apprentices, and also to (*b*) workmen. As to (*c*) foremen and managers, they should of course be able to judge of the quality of work and to direct how it should be done, but their principal business is organisation. As to (*d*) designers, special instruction is no doubt useful to begin with, but it appears to us that a good designer, '*nascitur non fit.*' With regard to (*a*) boys and apprentices, both in lithography and printing, we consider that in these employments (as in many others) instruction is very deficient, and, except in isolated cases, boys and apprentices have to pick up their knowledge as best they can. They are not *taught* much as a rule in ordinary workshops. Although we are decidedly of opinion that actual work at a business is the best method of learning, there can be no doubt that a definite course of instruction would be most useful and beneficial, but it should be given by practical men well acquainted with the actual work required by manufacturers of the present day, and should be accompanied by practical demonstration."

Messrs. De La Rue and Co. wrote:—"It is the writer's individual opinion that the utmost which can be done in the way of technical education as preparatory to entering on the actual practice of a trade, is to impart scientific knowledge of the principles which underlie all practice, and provide a thorough grounding in the true principles of art."

Messrs. Cassell & Co., Ltd., Ludgate-hill, E.C.—"We believe the chief impediment in the way of the English workman is his own indisposition to acquire any knowledge beyond what he thinks necessary to earn his living, and his disinclination to adopt any methods with which he is not familiar. The kind of technical knowledge which would be of use to apprentices, workmen, and foremen alike, and which would be supplementary to the usual workshop teaching, is :—

"Freehand drawing, which would place a man in sympathy with his artistic work.

"Mechanical drawing and machine construction. This would enable a man better to understand the machinery with which he produces his work.

"Chemistry—the nature of the pigments used in making lithographic ink, and the manufacture of colours and varnishes and paper.

"The compilation of a good text-book (with the most approved modern methods described and the best recipes given) would be of essential service."

Who Support the Art Schools?

IN the Annual Report of Technical Instruction, issued in Manchester, a reference to the Art School statistics points out that out of 602 pupils there are 268 "art students," 20 art teachers, 8 art masters, 2 art pupil teachers, 39 teachers, and 5 governesses, or a total of 342 who study art for its own sake and what they can earn by it as teachers, leaving 260 as the total of the artisan and labouring class who study to improve their own work. Of these 260, there are 24 litho artists, 4 litho writers, 1 lithographer, 7 engravers, 7 draughtsmen, 33 designers, 4 printers, 1 illuminating artist, 22 architects' pupils and assistants, 15 wood and stone carvers, 30 decorators, 3 glass painters, 2 pattern card makers, 3 pictorial and portrait artists, making a total of 156 to whom an art education is a necessity to their businesses. The remaining 104 include the following trades and professions:—Accountant, butcher, boxmaker, builder, calico printer, clerks (28), chemists' assistants, cabinet makers, dressmakers, enamellers, engineers, joiners, journalists, labourers, photographers, paper stainers, packers, solicitors, shop assistants, stamp maker, surveyor, stationer, tailor, traveller, upholsterers, wheelwright, warehousemen, and others not specified.

PEEP-BO!

By kind permission of the Proprietor of "In Town."

Colour Screens for Colour Photography.

In No. 20 of this journal is published a summary of the three-colour printing process as presented in a paper by Mr. F. Ives. On p. 39 is given the colours of the screens to be made and used, and on p. 40 the colour of the pigments to be used in printing. Closely touching upon the same subject is an article by Mr. T. C. Roche, of New York, in "Anthony's International Annual" (Vol. 7, 1895). In summing up his practice in making colour screens, he recommends the use of thin polished glass plates, coated with a collodion made by dissolving 2½ grains of "cotton" (as supplied by Percy Lund & Co.) in each ounce of solvent (made of equal amounts of ether and alcohol), and coloured with the required stain. When the coloured collodion has dried, a second thin plate of glass is placed upon it as a cover, and the edges of the two glasses bound with paper.

For orthochromatic plates, used for ordinary outdoor work, a colour stain found very suitable is auramine orange. This is kept in strong solution in alcohol, and let down with alcohol when required.

The other coloured screens are produced by staining with (1) methyl violet, (2) emerald green, (3) erythrosine; and by the use of two screens, viz., the auramine and erythrosine, it is possible to almost exclude every ray of blue.

The time of exposure is considerably lengthened by the use of screens. For indoor copying, the exposure with a yellow screen between is about three times as long as copying without a screen; whilst the combined yellow and erythrosine screens would make it necessary for an exposure of nearly twelve times the ordinary time. The green screen makes the exposure about the same as the yellow; and the violet screen does not make much difference from ordinary exposure without a screen.

Accompanying the article are two diagrams of the spectrum; one as photographed upon an ordinary plate, the other upon an orthochromatic plate. This example, like others which have appeared in photographic annuals, shews most clearly that an original in colour is utterly lost by being photographed upon an ordinary plate; whilst the orthochromatic plate saves a very large amount of the light and shade as expressed by light and dark colours, regardless of whether they are blue or red.

To appreciate how well the half-tone idea lends itself to lithography, it is only necessary to carefully examine any of the small imitation photographs given away with cigarette packages.

It will be interesting to know that Messrs. Dawbarn & Ward have in preparation a most exhaustive "Cyclopædia of Photography," by Dr. E. L. Wilson, to be published at an early date.

On Cranks.

"Do not be too hard on the 'crank,'" says a contemporary. "The man who cultivates a fad like photography, entomology, boating, bicycle riding, athletic sports, microscopy, painting, drawing, music, fishing, hunting, or one of the thousand and one other things which may be brought under this head, has always something within his reach which makes him independent of the outside world. The mineralogist has an endless pleasure in arranging his specimens and in obtaining those which are new. The sportsman fights his battles o'er again, and the fisherman attends to his tackle and invents 'facts' to illustrate his next year's exploits. And the photographic faddist finds something worth 'taking' wherever he goes, and takes it, yet you cannot lock him up on a charge of petty larceny. Such harmless amusements are more valuable than silver, because they take a man away from himself. They would be worth more than gold if they took him away from other people as well; but they do not do that, they only seem to take him away from himself and bring him to somebody else, and he generally stops long enough to make that somebody else feel tired." Someone hints that the printerian crank is doubtless one of the choicest specimens of the order.

But after all, observation of the ways of the much-maligned "crank" amply demonstrates that in his vagaries there may be much that is even admirable. His apparently wasted enthusiasm is not valueless—there is as often as not much "method in his madness." If in no other respect than that of providing any amount of fun to the flippant non-crank spectator he is surely not useless, though one does not aim at that sort of mission in life. The utter absorption into which he is apt to fall when in the pursuit of his hobby—a concentration of purpose apparently worthy of a better cause—is an object lesson to those one may not inaptly term human butterflies. Must it not be admitted that it is the crank individual who by his researches often discovers and develops scientific facts and useful and valuable ideas in so many directions? The mere fact of his being a thorough crank may possibly demonstrate the possession of vigour and some degree of ability, and in finding an outlet this is carrying him out of the ordinary groove. Are we not apt to treat our crank neighbours with good-humoured indulgence—as harmless lunatics or as more or less interesting specimens of infancy—when as often as not we ourselves may be drearily slogging along in the furrows—prosaic and normal—whilst they are steeped in the joys of pastures new? It is remarkable how little the well-developed crank heeds adverse criticism, and more or less sarcasm; raillery or suppression affects him but as the grass which is trodden but to grow anew. Good old crank. May more of us join your (c)ranks.

BY CHARLES HARRAP.

CHAPTER XVIII.

PRESERVATION OF ORIGINALS, ON STONE, OR AS TRANSFERS.

1. PRESERVING INKS ON STONE.

ONE of, perhaps, the worst features in the management of lithographic establishments, is the way in which originals are put away for future use. The subject does not receive the attention it should do, and consequently a large amount of work is spoiled annually, which by proper usage should be almost, if not quite, as good as when first put away. These remarks do not apply to such originals as are in weekly or monthly use, but more especially to stones put away for longer periods, and may only come into use annually, or at even longer periods.

The subject of the preservation of work divides itself into four parts, viz. :—(1) The ink used for both "stone" or "transfer-paper" preservation; (2) the transfer paper used; (3) the methods employed in rolling up, gumming, and covering the stones; and (4) the gum used.

The ink to be used for rolling up the work on a stone which has to be put away should contain sufficient non-drying fat in it to prevent the drying of the ink by oxidation, and should have a sufficient body to work firmly and sharply upon the stone, without ultimately becoming soft and finally thickening upon the stone. Inks of such a nature can be compounded in a variety of ways, and one which commends itself is :—

(1) Pre. Ink.	Printing ink	2 ozs.
	Tallow	2 ,,
	Beeswax	4 ,,

The tallow and wax are melted together, and the printing ink stirred well in. If too thick, it is recommended by old authorities to thin it with turpentine, but this undoubtedly tends to harden the ink by evaporation of the turpentine, and the consequent residue of a small amount of resin. It is far better to use a small quantity of Manders' or Trochard's pomade to soften the preserving ink.

Another preserving ink may be made of :—

(2) Pre. Ink.	Lard	4 ozs.
	Tallow	4 ,,
	Wax	4 ,,
	Printing ink	8 ,,

This can be mixed by melting the tallow and wax, and grinding in the lard and ink. In use it may require thinning, and for preference, use one of the pomades already mentioned.

Another recipe consists of :—

(3) Pre. Ink.	Tallow	2 ozs.
	Wax	1 oz.
	Stiff varnish	1 ,,
	Venice turpentine ..	1 ,,
	Stiff printing ink	2 ozs.

And mixed in the same way as those already mentioned. Such a recipe cannot be highly recommended, owing to the presence of the stiff varnish and turpentine. Nevertheless, it is used successfully by some printers, and can be accepted upon a limited practical experience. If it should require thinning, it is most essential to use one of the pomades.

Another recipe consists simply in the mixing of a small quantity of a good letterpress ink with a good soft litho printing ink. In such a mixture, so much depends upon the good quality of the inks—which, unfortunately, cannot be guaranteed—that it is better to compound a preserving ink from known ingredients, than to trust too much to commercial compounds.

A substance which could very well be introduced into a preserving ink, is stearine. This is sufficiently hard that it might be successfully used to replace both tallow and wax in the preceding recipes, thus introducing a powerful non-drying grease, of a firm consistence.

To use these inks, the work should be washed out with a stearine and turpentine mixture, keeping a little gum in the damping water when rolling up with either of the above inks. When well rolled up, and in every way satisfactory, allow the stone to dry, and any turpentine used in the process to evaporate. Upon the entire surface place a sheet of paper which has been previously gummed all over with a continuous film of gum arabic, to which has been added a few drops of izal, carbolic acid, or salicylic acid, and a little glycerine. Treacle may be substituted for the glycerine. In taking such precautions, it should be remembered that gum arabic alone must be used. The British gum turns acid by exposure to the air, and has been the cause of many excellent drawings being entirely destroyed. Again, the introduction of an antiseptic, such as izal, prevents gum arabic from souring, and the glycerine or treacle keeps the gum from becoming too brittle. Gumming the paper, instead of the stone, tends to exclude air more securely.

The inking up may be done in another way, by finally dusting the work with resin, and upon it

placing the gummed paper as above. But such a course, however well managed, is sure to give a brittleness to the ink which is undesirable and were better avoided.

There is a method of preserving by dusting, which is certainly more likely to give the required result. After the work has been carefully rolled in, let it be dusted with a very fine powder of stearine. This requires doing very carefully, but is almost a permanent preservative when covered up by a gummed paper as already described.

After a stone has been put away for any length of time it will require special treatment—even under the best conditions of gumming up and inking—to remove the old ink and bring back the work to a fit condition. It frequently happens that originals, especially those for which there is probably very little call, are put away in odd corners, and, more often than not, they are stored in cellars which are not thoroughly dry. It may be taken as a rule that stones when put away become damp, and on bringing them out again the moisture requires to be thoroughly dried out before any attempt is made to roll the work up. Thus an ordinary polished stone may require to stand before a fire for several hours, or in a heater for a day, and a grained stone may have to lie in a heater with a good steady heat for two days before the moisture is expelled, and the ink to a certain extent revived. This treatment is more necessary in winter, to assist the ink as well as to expel moisture.

When dry, it is not advisable to wash off the gum entirely. If the stone has been covered with paper, the paper must be soaked off with as little moisture as possible, and the stone allowed to dry again after its removal. Under any circumstances, wet or dry, always keep a little gum on the stone.

It is better to dry the gummed surface of the stone, then with a very spare wash of water remove the gum from the ink; the ink being comparatively free, proceed to wash it out. If it has been properly put away in a good non-drying preserving ink, it should readily be washed out with turpentine. It is not advisable to wash out in raw turpentine, but to temper it with a small admixture of some good oil. The mixture to be recommended is a solution of stearine in turpentine, or a mixture of equal parts olive oil and turpentine, or a solution of palm oil in turpentine; or terebene may be quite strong enough to wash out, and not too searching to destroy the work. Under almost the worst conditions of inking, together with age, if turpentine or terebene be strengthened by the addition of carbolic acid or izal, as well as an oil, there is very little doubt—if any at all—that the ink will be removed. Experiments have clearly proved that where turpentine has been ineffectual, the addition of izal has at once removed ink which has been upon a stone seven years, and it has not required any great mechanical force to assist it.

It almost seems superfluous to add any other methods of washing out ink which is of long standing; but as there may be extreme cases, a few more methods will not be out of place. They may be briefly summed up thus:—Allow the stone to be flooded with turpentine, benzoline, or cremoline (which is a new material, most probably of the nature of izal). If these prove ineffectual, then rub the ink with a coarse flannel dipped in either of them. In the most obstinate cases, also dip the flannel upon some fine powder, such as chalk, tripoli, rouge, powdered Indian red, or powdered cuttle fish bone, and gently scour the ink off. The scouring may be carried to the extremity by rubbing off the ink with a stick of willow charcoal.

The methods which are at hand are so numerous that one of them is bound to be successful, and it should always be borne in mind that the ink may be actually polished off with a flat polishing stone, after which the work will rub up even finer than by simply removing the ink by the foregoing chemical and other mechanical means. Polishing cannot be applied to grained stones.

To secure the best results, the process should be confined to washing out chemically with turpentine, oil, and izal, followed by the use of lithophile, always keeping the dry gum solution on the stone, until the lithophile has strengthened the work. After that the rolling up may be at once proceeded with.

2. PRESERVING ORIGINALS ON TRANSFER PAPER.

In chapter XIV., when treating of transfer paper, as full a description as possible was given of Bertling's imperishable transfer paper, shewing how transfers can be preserved, and an excellent example of such preservation was given as a supplement to THE BRITISH LITHOGRAPHER, vol. III., No. 15.

In *The Printing Times and Lithographer* of January 15th, 1888, was published a process which seems to bear a very strong resemblance to that known as Bertling's, and its details are as follows.

The "transfer paper" is prepared upon a good sound soft paper, only partially sized. Coat the paper on one side with a freely working solution of starch and allow it to dry. Coat the paper a second time with a thinner solution of starch, to ensure a smooth surface, and, when dry, apply a third coating of:—

Good gum arabic solution ..	1 gallon.
Gallic acid	½ oz.

When dry, the transfer paper must be well rolled, and is then ready for use.

The preservative ink is compounded of:—

(4) Pre. Ink.	Spermaceti	2 lbs.
	Sperm oil	8 ozs.
	Charcoal..	2 lbs.

The spermaceti is melted at as low a temperature as possible, and when quite melted, the sperm oil

and charcoal are well stirred in, keeping the mixture warm, and stirring for about ten minutes. The mixture is poured upon a cold slab of marble, or litho stone, and allowed to go quite cold and hard. It is then cut up as small as possible, and finally pulverised. The powder thus produced is sieved through muslin, and kept in a bottle for use.

So long as the principles are kept in view, the constituents of this preservative ink or powder may be varied. Animal charcoal may be used in place of vegetable charcoal. Stearine or mutton suet may be used in substitution of spermaceti, and sperm oil may be replaced by palm oil.

The method of use is similar in most respects to pulling good transfers upon paper, and ordinary lithographic transfer ink may be used for that purpose. A more suitable ink for this purpose consists of:—

(5) Pre. Ink.	Mutton suet	4 ozs.
	Yellow beeswax	3 ,,
	White curd soap	3 ,,
	Shellac	6 ,,
	Vegetable black	20 ,,
	Sperm oil	4 ,,
	Spermaceti	3 ,,
	Mid. litho varnish ..	3 lbs.

This ink is prepared in the same manner as lithographic writing ink. The suet, wax, and spermaceti are melted and ignited, and while burning the soap is added. The flames are extinguished, and the shellac is added. Whilst keeping the liquid well stirred, the sperm oil, varnish, and black are added. When thoroughly mixed, it is poured into vessels for future use.

Having rolled up the original in either lithographic transfer ink or the special ink just mentioned [(5) Pre. Ink)], some of the preserving powder [(4) Pre. Ink)] is dusted upon the transfer, and is brushed over it with a fine camel-hair brush. The surplus may be shaken off, and finally cleared by wiping the sheet with a soft rag. The transfer is then fit to put away for preservation. In this condition it can be put away between sheets of paper, and only an ordinary amount of care need be exercised in its usage. If it is intended to use this method of preservation, it is advisable to pull the transfers before any others have been taken from the stone, to ensure them being the best that can be taken from the stone.

When the preserved transfer is required at some future time, it is put down upon a well polished stone. The stone is warmed by the application of hot water, and whilst still damp the transfer is laid on and pulled through. The paper is then damped with hot water and run through again, the operation being repeated until completely transferred, and the paper easily removed from the stone. It is then allowed to stand with the composition upon it for some time. If the transfer is not old, the rubbing up and proving may be at once proceeded with. If it be an old transfer, it is better, after removing the paper, to warm the stone in front of a fire, or by the using of the spirit lamp flame. The process would be greatly assisted by the use of lithophile. The transfer is then in a fit condition to print from.

In using this process, for the sake of certainty, it is advisable to have several transfers prepared from the same work in the first instance. If one is not successful, then the others may be used, until a good stone is produced.

In methods of preserving work, it should always be borne in mind that the present patent zinc plates can be used most successfully for receiving the originals, saving thereby the loss of capital in stones standing idle, and the space usually occupied by bulky stones.

* * * * *

The Merchandise Marks Act.

A bill to amend "The Merchandise Marks Act, 1887."—Be it enacted by the Queen's most Excellent Majesty by and with the advice and consent of the Lords Spiritual and Temporal and Commons in this present Parliament assembled and by the authority of the same as follows:—

1. All goods of foreign manufacture imported into this country shall be plainly and distinctly marked with the names of the country in which such goods have been manufactured. Such marking shall be legible and not in any way defaced before passing into the hands of the consumer.

All goods which are partially made in foreign countries and only finished in this country should bear a trade description in accordance with that course of manufacture as far as possible.

Where it is impossible to print, paint, engrave, stamp, cast, or stencil such names on the goods themselves the name of the country in which such goods have been manufactured shall be appended by a gummed label, tag ticket, or printed certificate on all such goods offered for sale.

2. That all articles manufactured in Great Britain and Ireland by skilled labour without the aid of any motive power other than that which is provided by the muscles of the workman shall be marked hand-made.

3. Every article of gold or silver ware whether imported or otherwise sent to any Assay Office in the United Kingdom for the purpose of being assayed stamped or marked shall be dealt with in accordance with section eight of the Merchandise Act of 1887.

5. Every person who knowingly or wilfully fails to comply with the provisions of this Act shall be liable subject to the provisions of section two sub-section six of the above-mentioned Act on summary conviction to a fine not exceeding *twenty pounds* for each offence.

6. This Act may be cited as the Merchandise Marks Amendment Act 1893 and shall be read and construed with the Merchandise Marks Act 1887 as one Act.

* * * * *

THE invitation card to the Lord Mayor's Banquet at the Guildhall is an exceedingly creditable specimen of colour work, and, as usual, particularly appropriate in design. Three views from water-colour drawings include the Lord Mayor and the Sheriffs, a view of Aldersgate, shipping, and the Guildhall. The colour scheme is nicely in harmony with the coat of arms shewn in the design.

Litho Machine Management.

[B.L. PRIZE COMPETITION.]

THE first evidences of good machine management are cleanliness and general good order. The roller skins should be nicely strained and fit close to the flannel underneath to prevent slipping, while the flannel itself should be sewn firmly and without a crease, or the roller will be cut in scraping. A roller should never be packed to be larger than the runners, but should it stretch unusually large it may be kept from slipping by straining tightly to one end and cutting an inch or so off its length, when more holes may be punched to lace the end in.

Damping rollers also require to be sewn up very evenly to avoid creasing, and should be well washed and scrubbed occasionally. A faulty damping roller is a frequent cause of work rolling off during printing.

The cylinder of machine should be covered with a treble milled blanket, and over this a sheet of good American leather, from which all ink, etc., can be easily wiped.

In starting a job the first thing to be considered is the pressure. This should be got accurately, using a spirit level for large stones. A minute or so spent carefully here will save time later on.

In mixing the colour, three points must be considered, viz. :—The speed of machine, the nature of the paper, and the character of the design on the stone. Speaking generally, the faster the machine runs, the thinner must be the inks. Fine copperplate work, etc., requires a much stiffer ink than a job where there are large patches of solid colour. A hard enamel paper requires a much stiffer ink than a soft spongy one.

The duct in modern machines is rendered almost perfect in action for feeding the finest or most solid job, so no trouble should be apprehended here, but it will be found convenient to make some lead stops to keep the ink just where it is wanted in the duct. These are easily made by pouring some melted lead into the duct end, having a piece of clay to keep the molten lead where it is wanted.

When the set of job is obtained, a miss should be pulled on the cylinder and the solid parts of job overlaid to bring them up more fully, and lighten the fine parts.

Before starting, it should be seen that the water trough is filled, the stone properly locked up, and the side lay tight. A start should not be made until everything is in order, and then there will be no hindrance afterwards. Supposing a start to be made, I will now briefly describe some of the machineman's difficulties, and begin with

PAPER CREASING.

This is generally caused by newness or greenness of the paper, and is difficult to remedy. It may sometimes be cured by reducing the pressure slightly at the back edge, or by a careful adjustment of the cylinder brush. Sometimes the grippers only hold the sheet at one end, allowing the sheet to slip and crease—the remedy for this is obvious ; but in severe cases, the only remedy is to hang the paper up for a time to allow it to mature somewhat. I have cured creasing sometimes after all other remedies have failed, by spreading the paper on shelves in a hot drying room and allowing it to get quite warm.

With regard to paper stretching, so much has appeared in the B.L. on this point, that I would only just say that I have found the remedy advised there, to run the paper through the machine lengthways over a damp stone, very successful.

Another difficulty is

WORK ROLLING OFF.

There are various causes for this : too much water, ink too dry, a loose skin on rollers, or a faulty damper, will cause the mischief ; in some cases the ink will eat away the work, or it may be fretted off by a hard gritty paper, or by the too liberal use of stale beer or other etcher. The first causes enumerated require no explanation, but when rolling off is caused by the ink or gritty paper, the use of Manders' pomade will greatly facilitate matters. In obstinate cases, if there is room at the sides of the job, it is useful to give the stone a good sharp etch at the sides ; this will cause the rollers to have a firmer grip on the stone, and help to keep the job good.

Another difficulty is

WORK CATCHING AND SPREADING.

If the water used will not keep the job sharp and clean, recourse must be had to the usual remedies, such as stale beer, cold tea, thin gum water, etc. If stale beer is used, it is better to try it diluted first, as it is a sharp etcher if freely used.

There are various remedies for tinting, etc., in the market, and they will be found useful at times, particularly when using very common inks, as some employers prefer to buy the commonest materials and spend the money thus saved (?) in buying articles to help work them. Personally, I fail to see the economy of this.

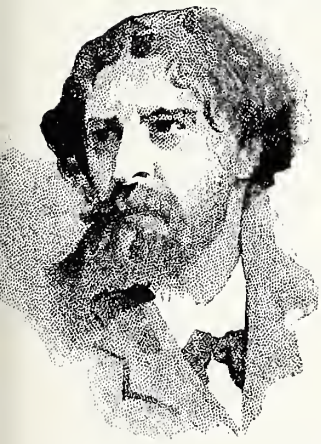
I have thus briefly touched on the main points in machine management ; space forbids more, but I would say, in conclusion, that I am not egotistical enough to think I have written anything new to the practical man, but hope that my hints will be found of benefit to the young and inexperienced.

"CLIMAX."

FROM Messrs. S. B. Bolas & Co., 11 Ludgate-hill, E.C., we have received a set of four collotype views, shewing picturesque buildings and an interior. The four pictures are worked in as many separate shades, shewing suitability and pleasing effect in every instance. As specimens of printing, they are commendable in every respect.

Some American Artistic Posters.

THE series of artistic posters issued by the *Century* Company, New York City, is well worth the attention of British artists. Arrangement, design, colour scheme, and printing are all highly commendable, and doubtless the results from such advertisement will encourage others to take up the art poster. Now that metal and enamel plates have so largely replaced litho posters in various directions, the attention of the trade may be again drawn to the increase in popularity of pictorial posters.



Some of the designs are by Continental artists, notably that announcing the new "Life of Napoleon." This poster is worked in several colours, and is most effective and pleasing, while being appropriate in delineating "le petit Caporal." The design is by E. Graset.

"The Land of Pluck," a book about Holland, is announced by a striking poster printed in three colours. What might at first be regarded as an aurora is used as a background, in front of which is a series of wind-mills, at once exhaustive in style and picturesque in arrangement. The foreground would appear to be an expanse of water over which is printed the legends descriptive of the book.

"Imagination's Truthless Tales" is advertised by a florid poster in which red alongside of purple holds the eye long enough for the scheme of the sketch to become apparent. An Eastern fakir or magician stands within a charmed circle and with wand marks the course of a cloud of vapour or smoke, in the fold of which appears a gruesome face that in hideousness defies the worst that imagination can do.

A new Brownie book is advertised by a poster in two colours—brown and salmon. There is centrally a representation of a globe shewing the side containing the western hemisphere, over which is printed the legend "The Brownies Around the World." Around the world thus prescnted are the Brownies in full attire, joining hands and dancing, perhaps to the "music of the spheres."

Other posters relate to different issues of the *Century Magazine,* and to various books which the *Century* Company have recently put out. The complete poetical works of Richard Watson Gilder are announced by a very striking poster, unlike any other in the collection. "Five Books of Song" is the legend in white over a conventional scroll centrepiece, over an olive background.

In many of the posters two workings have been utilised so as to give the effect of three colours, and the whole are effective as advertisements to a most satisfactory degree.

* * * * *

Litho Line Plates.

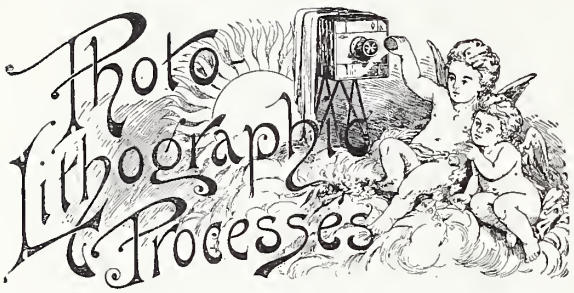
LITHOGRAPHIC zinc plates are now issued in various grains, such as sand, "worm," and hand stipple. The grain is in relief, so that the artist may rub the tints in with litho chalk. We imagine a very good effect might be obtained by inking a swelled gelatine relief, and pressing it in contact with one of these grained plates. The finer grains might be used for photo-litho work. We notice that, in the instructions for rolling up these plates, it is recommended to add a 1 oz. to the pint solution of bichromate of potash to the gum solution. This is sponged over and wiped off until a very thin film is left on the plate, and is then allowed to dry thoroughly, but must not be left on the plate more than fifteen minutes, as the film is sensitive to light. We presume that the idea is to bind the gum better to the plate by the slight tanning action which the bichromate will set up. Anyway, this method allows of the work being "washed out" with turps, applied with a dry piece of felt or flannel, without moistening the gum. When all the work is removed, the plate is rolled up quite solid with black ink. The plate is then damped, and the roller applied until the work appears nice and sharp. Zinco etchers who use the rolling up process may possibly gain a wrinkle from this.

Messrs. Penrose and Co. handle these litho zinc plates, and particulars will be sent on application to them.

The two illustrations on this page are from plates prepared from the litho line plates.

* * * * *

MESSRS. W. J. EDWARDS & CO., Christchurch, N.Z., say: The B.L. is a magnificent publication, worthy of the support of the whole workers of the world engaged in the arts and labours of which it treats. After reading it the feeling irresistibly creeps over one that we have much to learn and aspire to. It is a true educator, and may you receive that genuine support which your efforts to elevate our ideals is justly entitled to. We enclose subscriptions for two copies of succeeding volume, as we see No. 18 will complete Vol. III.



COLLOTYPE.

CHAPTER XX.

MISCELLANEOUS REMARKS ON COLLOTYPE.

THE production of the grain in the collotype film depends upon judicious drying, probably more than anything else. The grain may be increased by using larger quantities of the crystallising salts of chromium; but the addition of common table salt does not assist the formation of grain at all. Extra quantities of such salts as chrome alum almost render printing impossible.

The leather inking roller requires to be scraped so that the nap is not scraped off every time it is thrown out of use, and should be smeared over with a pure grease which must be scraped off before using again. The composition roller is cleaned by rubbing off the ink with linen rag wet with turpentine.

India-rubber rollers have been found very valuable for collotype printing, in place of the glue roller, but they are more expensive and liable to go wrong. Such a roller must be soon washed clear of the ink, with as little turpentine as possible. Then the turpentine must be thoroughly washed out with a little soap or a plentiful supply of water. If the rubber roller should shew signs of dissolving, then it must be rubbed with French chalk, which will eventually absorb the turpentine and grease. The best plan is to coat the roller when new with a solution of pure or bottle rubber in benzole or sulphide of carbon, after washing it with turpentine. Instead of using turpentine to clean india-rubber rollers, it is stated that strong alcohol, or lye, will meet the purpose.

Collotype plates should be put away quite clean. The ink should be all washed out with turpentine, and the film thoroughly washed in water to get rid of all the damping or etching solution. If the ink refuses to be washed out, then the film should be washed over with warm water; after which the cleaning can be effected.

In case any additional descriptive lettering requires to be added to a collotype film, it can be written on with tannin. This substance may also be used to touch up any weak spots on the picture.

The negatives should be made as complete as possible, by thoroughly repairing all defects and adding all the descriptive lettering, before they are printed upon the collotype film. It is preferable to have all descriptive lettering added to the original, either by hand work or by type impressions, before the photographic negative is taken. If any descriptive lettering or other matter requires to be added upon the collotype film, it must be written or drawn upon it with a strong solution of tannin in water. The picture on the film may be carefully touched up with this solution. A mixture of gum arabic and potassium bichromate may be used for the same purpose; but that will require a subsequent exposure to light, to cause it to harden in the same way as the original print was formed on the film. If the descriptive matter has been too highly exposed, it will possibly cause the film to be so compressed that the surrounding gelatine will swell on damping, and to such an extent as to rise above the lettering and prevent it printing black. This may be remedied by using thinner ink, or by treating the gelatine film with a weak solution of alum to harden it a little.

Spots on the film are difficult to remove successfully. Such chemicals as ammonia and acids (other than tannic) may be used to remove such spots, but the effect is not permanent.

In one of the "etching" solutions oxgall is included. This substance has a beneficial effect in hardening the film, and assisting in a large issue from one plate. It, in consequence, prevents the softening of the film, and its tendency to stick to the paper each time.

A collotype printing ink may be compounded of:—

White wax	45 parts.
Gum elemi	15 ,,
Litho printing ink (about 5/- per lb.)	20 ,,
Mid. varnish	5 ,,

with which the whole film may be rolled in solid all over. After which the film may be cleared, and the picture developed by washing it out with a solution of:—

Gum arabic	30 parts.
Oxgall	15 ,,
Ammonia	15 ,,
Water	90 ,,

Then the plate is ready for printing from, the printing ink being any suitable ink, such as good chalk ink, or Japanese black and lard, or thin copperplate ink. This method of preparation is published in Kleffel's "Manual of Photography."

Fritz Horle makes a special ink for collotype printing, known as photo-tint ink No. 1152, which can always be obtained direct from his agencies in Manchester and Dublin, and his manufactory in London.

To prepare a collotype printing ink, the following method is recommended. Take four ounces of best chalk ink, and work it up with one ounce of mid. varnish, a drop of olive oil, and two drops

of French turpentine. It is then ready for distribution.

Olive oil is generally used for reducing the printing inks; but a more serviceable material is the pomade manufactured by Mander Brothers, and E. Trochard.

Dull enamel paper is considered by some printers as a good one for collotype prints. The surface is, however, liable to break off if the film be more than ordinarily adhesive. A half-sized litho-printing paper, or plate paper, is undoubtedly the best. Well-sized fine-glazed papers are the least likely to adhere, but they give hard impressions. Fine-faced cardboards are useful when the prints are not to be glazed. Prints upon well-sized paper may be sized with a weak solution of gelatine; after which any retouching must be done, before they are rolled and varnished.

Another formula for an "etching" solution, as already described in the beginning of chapter XIX., is:—

Glycerine	3 parts.
Ammonia (liquor)	1 part.
Nitrate of lime	one-tenth ,,
Water	5 parts.

The etcher is made for use by adding five or six parts of this solution to one hundred parts of water.

Retouching prints should be done after they have been sized with a thin watery solution of gelatine. Spots of white can be covered up by touching with an ink prepared by thinning down the printing ink with turpentine; or it may be effectively done with litho chalk. Black lead must not be used for retouching. The white margins of prints may be cleaned by rubber ink eraser.

All prints to be varnished must be previously sized, and must be perfectly dry before rolling or burnishing. The sizing may be made of a ten per cent. solution of gelatine. It can be laid on with a flat camel-hair brush, and the prints pinned up to set. A good varnish, which is colourless and sets hard, is compounded of:—

Bleached (white) lac	15 parts.
Wood naphtha	100 ,,

When this mixture is made, a certain cloudiness results from the presence of fatty matters. If thirty parts of benzine or petroleum ether be added, this fatty matter collects towards the upper part of the varnish and can be poured off. Or the fatty matter may be carried to the bottom by adding powdered lime. The bulk of the varnish may be poured off and filtered, whilst that with the lime in it may be subsequently filtered several times, and is ready for use. The varnish is best applied by a dabber, care being taken to exclude all air bubbles. After varnishing, the prints may be dried by direct heat, care being taken to prevent any flame having access to the print. With a series of gas jets placed above a screen of wire gauze, and the prints underneath the gauze, the drying can be readily and rapidly accomplished. This may be facilitated by enclosing the gas jets, gauze, and prints in a metal box.

Another method of varnishing is to dip the prints into a solution of:—

Borax	130 grains.
Carbonate of soda	6 ,,
Water	500 ,,
White shellac	100 ,,

The borax and soda are dissolved in hot water, and the shellac added slowly. When all are well mixed, this varnish is filtered and ready for use. In winter it should be kept up to 15° to 20° C.

For varnishing prints on enamelled paper, prepare an alkaline solution of shellac thus:—Place in a tin vessel or bottle, large enough to hold ten pints,

Bleached and powdered shellac	18 ozs.
Alcohol or wood naphtha	54 ,,
Strongest ammonia liquor	45 ,,

and mix well together. In a few days the shellac will be completely dissolved. When dissolved, keep the mixture constantly stirring whilst adding $5\frac{1}{2}$-lbs. of hot water. When cold, the varnish is filtered. It may be applied by floating the prints upon it; or by laying it on with a Blanchard brush—a piece of swansdown calico tied over the end of a thick piece of glass, so that it covers the glass, and forms a firm rubbing tool.

Prints may be treated with sulphuric acid, so as to convert the surface of the paper into a vegetable parchment. The solution is prepared by adding very slowly one pint of water to two pints of sulphuric acid. When added, considerable heat is evolved, which must be allowed to cool down before use. In this strong acid the prints may be momentarily immersed, withdrawn, and washed in clean water containing a few drops of ammonia. The prints must be dried under pressure, or on frames; finally varnished, and dried by heat.

The negatives suitable for collotype may be ordinary dry plate productions of a good quality. The gradations from light to shade must be quite distinct. The lights must be perfectly free from fog, and the negative should not be intensified. There should be good contrast of tone, without hardness. Although dry plate negatives may be used, the wet collodion process gives the most useful negatives, because they can be converted into film negatives with much greater certainty than dry plates. The latter when made into films are difficult to keep flat, and are apt to break in the course of printing in the photographic printing frame, or give an indistinct image. It has already been pointed out that negatives for collotype work must be reversed, and the methods of reversing have been fully described in chapter XVIII. Stripped films are always preferable, because there is so much less chance of breakage under the pressure in the photographic printing frame. If the negatives are not to be stripped, then they should be prepared on patent plate, and finally

coated with a very thin, thoroughly transparent photographic varnish. The negatives for line subjects must be the same as for photo-lithography; that is, thoroughly clear glass in all the lines, and intense and opaque tints for the shadows of the negative, or whites of the subject. For line subjects, the printing ink for the collotype process should be good chalk ink.

In the course of printing, the damping solution or water may be tinted by small additions of weak watery solutions of any desirable colour. In this way a tinted ground may be added to the print.

* * * * *

Is Mental Work Agreeable?

THE MENTAL TAX OF DESIGNING.

THE problem of work is one of the most important problems in which humanity is interested, and it raises a number of hygienic and moral questions. After very careful investigation of the problem of mental work, we must arrive at the conclusion that it is distasteful, and that man avoids mental effort as far as possible, because work of that kind means fatigue, and fatigue means pain, which is naturally disagreeable.

At first glance this conclusion appears contrary to fact; numerous instances can be produced of the ill effects of intellectual idleness, and we see people *seek* employment for the mind in study, reading, or in playing such games as chess. True; but such employment is not *work*, it is *exercise*. Every organ has need of exercise, and prolonged inactivity injures it, but real mental *work*—the production of something original—is distasteful. It demands effort, which is fatiguing.

A merchant may be transacting business for ten hours, but he only performs real mental work when he has to deal with some matter which is entirely new. The transaction of ordinary business is exercise, because it consists of matters similar to hundreds of others which he has dealt with in the past; these tire the brain in time, but do not demand that effort which is required for the production of something new.

Hence we have so little that is original; hence the widespread tendency to seize upon the original work of others and adapt it. Further proof of the correctness of the above-stated conclusion is to be found in the works of most of the great writers and scientists. Take their earlier works and you find originality, but as time goes on there is less and less of it—the same ideas, the same style, the same fundamental type of characters are apparent in each fresh work which they give to the world. The mental *work* has given place to intellectual exercise. There are a few exceptions, but only a few.

Mr. Beard, an American psychologist, estimates that the creative period only lasts ten years, generally from the twenty-fifth to thirty-fifth year. It is certainly a common thing to see the originality of artists fall into mere mechanism, to see scientists lose the spirit of observation and become bound up in "systems." This is due to what may be called the law of least effort. Mental activity, like other kinds of activity, tends to become automatic; effort ceases, and originality disappears. Those few who do not succumb to this law are gifted with more than the usual share of energy.

* * * * *

VERY many readers know at least something of the work of Philip Gilbert Hamerton, who died on November 5th last, at Boulogne-sur-Seine. He was born sixty years ago at Laneside, Lancs. His first published writings, a series of articles called "Rome in 1849," contributed to the *Historic Times,* appeared in 1849, and two years later he published a work on heraldry. In 1855 he published a volume of poems illustrated by himself, and in the same year went to Paris to study French literature and painting. The next four years he passed between France and England, and during this time became a frequent contributor to the reviews. In 1886 he published a volume on "Etching and Etchers," and two years later two works on French art. His best known work, "The Intellectual Life," appeared in 1873, and in 1876 the results of the author's observation of French rural character were published under the title "Round My House." Other works of the author are two novels, "Wenderholme" and "Marmorne," "The Graphic Arts," and a number of other writings, critical and descriptive. He was a *Membre Protecteur* of the Belgian Etching Club; an honorary member of the Society of Painter Etchers, and in 1882 the French Government conferred on him the decoration of an *Officier de l'Académie.*

TO make a cement for mending porcelain, says *The Amateur Photographer,* precipitate copper in fine powder by shaking a solution of copper sulphate with small pieces of tin. Wash the powder thus obtained and take from twenty to thirty parts, the hardness of the cement depending on the quantity of copper employed. Place the copper in a glass mortar and add thereto sufficient sulphuric acid to form a paste. Then add seventy parts of mercury, stirring constantly so as to make a thorough mixture. Wash well, to remove all the sulphuric acid. To use the cement, heat the parts to be cemented to a temperature of about 370 deg., and the cement until it has the consistency of melted wax.

IT is almost superfluous at this time of day to say anything in praise of the literary, technical and artistic excellence of your magazine.—ALEX. MICHAEL, Dunedin, N.Z.

The Arms of the Boroughs and Towns of Great Britain.

Containing various points of note for the artist on the Art of Blazon.

Middlesbrough.

St. Ives.

St. Helens.

Burslem.

City of London.

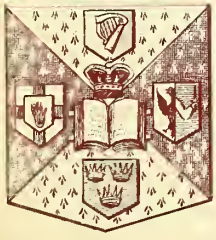
Wrexham.

Berwick-on-Tweed.

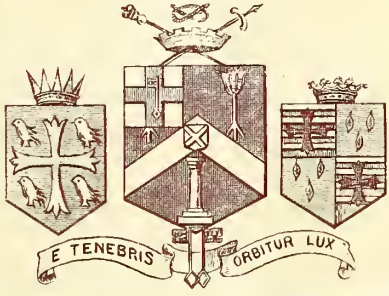
Plymouth.

Warrington.

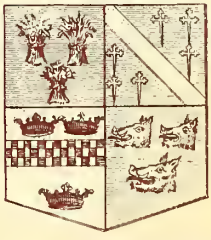
University of Ireland.



Wolverhampton.



County Council of Aberdeen.



What is Colour?

CHAPTER XIV.

BRILLIANCE AND LUMINOSITY OF COLOURS.

AFTER the phenomena dealt with in chapter XIII., the luminosity of colour is a fitting sequel. At first it is probable that the true meaning of the luminosity of colour may not be understood. But a little reflection will readily shew that all colours are not equally luminous. For example, the poster used for "Reckitts' Blue," printed in solid blue, with white lettering, has a striking effect upon any passer-by. The same poster printed in pale blue would not be so effective, although the colour might be more luminous; and printed in yellow, the poster would not be so striking, although the colour is more luminous. These latter colours being more luminous, so closely approach the luminosity of white as to make a poor contrast with that colour, whilst the less luminous colours form greater contrasts with white or other more luminous colours.

Reverting to the coloured spectrum in Vol. II., No. 11, there is no doubt that the greatest brilliance is at the yellow line, and the brilliancy dies away suddenly towards the red, whilst it declines gradually towards the blue. In tabulating the luminosity, a standard of 100 may be used to represent the luminosity of the yellow, near the D line. Thus :—

Yellow .. near the D line ..	100		
Orange-yellow	99	decreasing to	97
Yellow-orange	97	,,	94
Orange-red	94	,,	70
Red	70	,,	0
Yellow .. near the D line ..	100		
Greenish-yellow	100	,,	94
Yellow-green	94	,,	80
Green	80	,,	40
,, ... at the E line ..	55		
Blue-green	40	,,	15
Azure-blue	15	,,	8
,, .. at the F line ..	8		
Blue, blue-violet and violet	8	,,	0

The rapid decrease in brilliance or luminosity is best shewn by a diagram, and the following skeleton figure is given for that purpose. A second curve is put in the figure to shew the actual luminosity of the spectrum to a red-colour-blind eye. This second curve shews the lack of power to receive the full brilliance of every colour from the green to the red, whilst the blue-green down to the violet rays are equally appreciated by the red-colour-blind and normal eyes.

Following up these deductions with the one which is most necessary for the true appreciation of the luminosity of colours, it is necessary to take white light as the standard, and calculate the percentage of luminosity of the other colours. In the first place, take the spectrum itself, and with the coloured spectrum of Vol. II., No. 11, the comparisons can be tabulated thus, by referring to the lines of the spectrum—A, B, C, D, E, F, G, H—as deduced by Abney.

	White	luminosity	100
A line	deep red	,,	—
B ,, ...	crimson-red ..	,,	1·0
C ,, ...	scarlet	,,	20·6
D ,, ...	orange	,,	98·5
E ,, ...	green	,,	50·0
F ,, ...	blue-green	,,	7·0
G ,, ...	violet	,,	·6
H ,, ...	faint lavender ..	,,	—

By an elaborate and careful series of experiments, a number of coloured pigments have been compared with white light, and the luminosity of each has been determined. It is unnecessary to describe the apparatus and methods of procedure adopted. The results have been well examined, and may be accepted as a very close approximation to the actual truth. If errors occur, they are the errors of exceedingly fine measurement, and do not amount to more than one-tenth per cent. In the following table, prepared by Abney, will be seen the relative luminosities of different pigments, viewed under electric light.

Luminosity of white pigment	100	in electric light.	
,, vermilion	36	,,	
,, emerald green	30	,,	
,, ultramarine	4·4	,,	
,, orange	39·1	,,	
,, black	3·4	,,	
,, black (different surface)	5·1	,,	

It is noteworthy that the luminosity of mixed spectrum colours, or of mixed pigmented surfaces, is equal to the sum of the luminosity of the component colours.

To illustrate more closely the reflective power of some of the pigments used in colouring and printing, the four annexed diagrams have been prepared and adapted from Abney's deductions.

In the first diagram of the four yellow pigments, it will be seen by following the cadmium yellow curve that it is by far the purest yellow, and the most brilliant. The curve is even, and does not shew any large quantity of blue in its composition. The Indian yellow curve shews a large quantity of blue in its actual composition, whilst at the D line (yellow) there is a lack of the yellow itself; the continuation of the curve over the C and B lines shews the presence of a large amount of red.

Gamboge is distinctly a low-toned yellow, and shews irregularity in its reflective power, whilst it also has a leaning towards red. Yellow ochre is, if anything, a purer yellow than either Indian yellow or gamboge, but it is lower in tone. It is more free from green than either of the others, but has a redder tendency than cadmium yellow. All these conclusions can be readily seen by a careful inspection of the diagram (fig. 2).

In fig. 3 the luminosity of four red pigments is compared. The curves for vermilion and mercuric iodide almost correspond, except that the latter is less brilliant. They are both free from green, but

rise in the orange scale and decline in the deep red. Carmine and Indian red shew an irregular curve in the blue and green, whilst they fail to reach the height of vermilion in the orange scale, and, unlike vermilion, increase in the deep red properties. The faded Indian red shews less blue and more red than the fresh pigment.

In fig. 4 the brilliance of three green pigments is compared. The whole diagram shews that the most brilliant green is not as bright as either the yellows or reds. This is exactly what would be expected from fig. 1, in which the spectrum as a whole has its brilliancy compared. Emerald green shews a brightness and purity of green not possessed by the others, whilst terre verte is distinctly a low-toned pigment, the colour of which depends for its distinction as a green to the slight rise in its scale at the azure-blue, blue-green, and green scales.

In fig. 5 the brilliance of four fresh and two faded pigments is compared. Antwerp blue is the purest and brightest, and as a blue is brighter than when faded. In its faded condition it becomes distinctly greener, by the lowering of its reflective power of blue and its increase in the powers to reflect the yellows and reds. Cobalt, though having a fair proportion of blue luminosity, has also a strong tone of red in it, which gives it the purple or violet cast. French ultramarine is almost as pure a blue as Antwerp blue, but is much lower in its tone. Indigo is

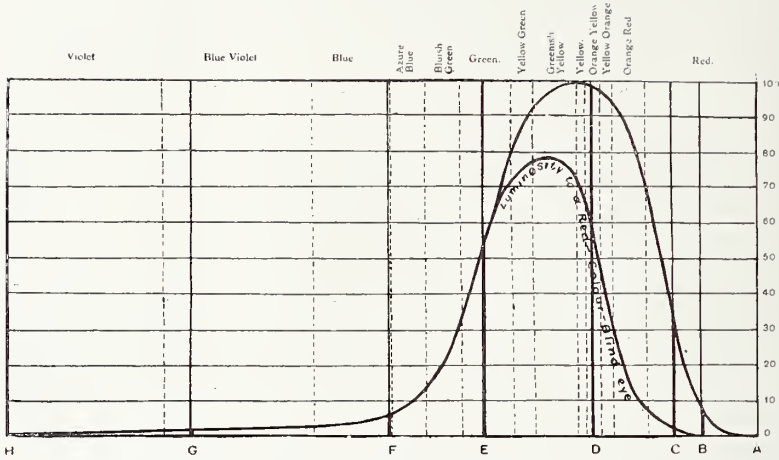


Fig. 1.—Diagram shewing the measurement of luminosity of the spectrum to the normal and red-colour-blind eyes. (After Abney.)

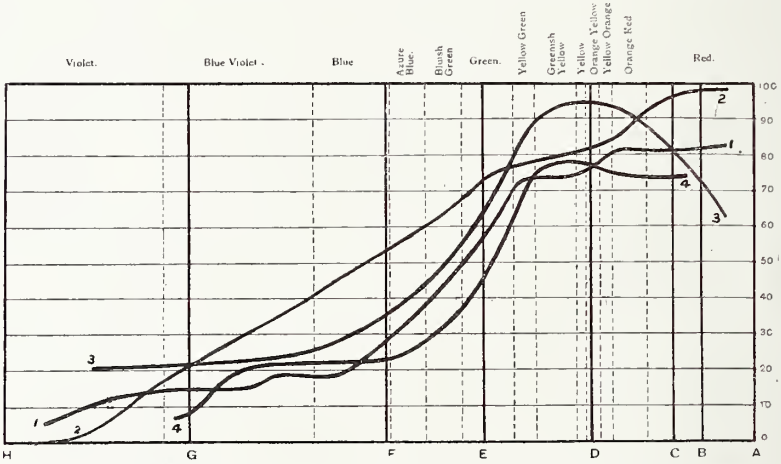


Fig. 2.—Diagram shewing the comparative brilliance of:—1. Gamboge. 2. Indian Yellow. 3. Cadmium Yellow. 4. Yellow Ochre. (Adapted from Abney.)

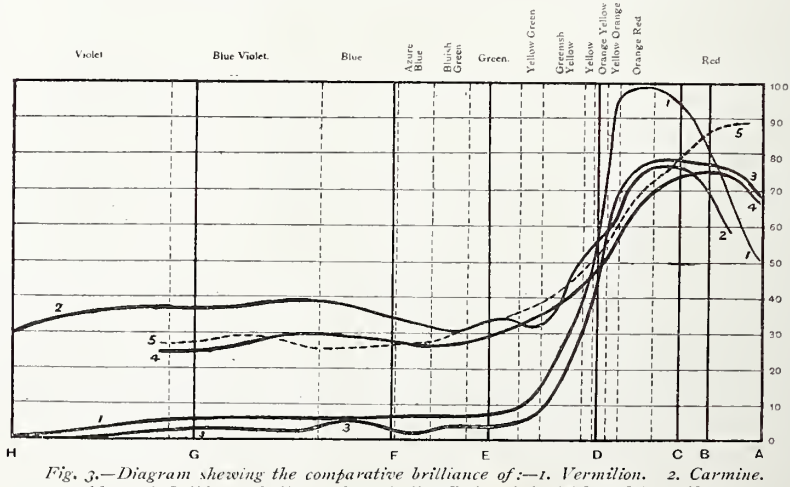


Fig. 3.—Diagram shewing the comparative brilliance of:—1. Vermilion. 2. Carmine. 3. Mercuric Iodide. 4. Indian Red. 5. Indian Red, faded. (Adapted from Abney.)

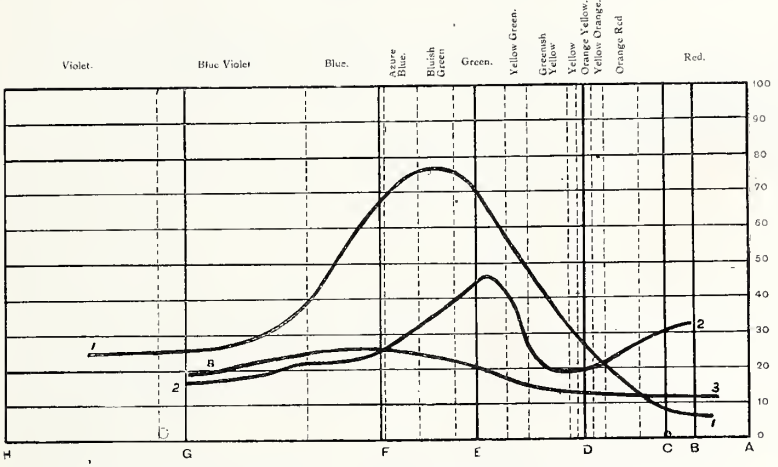


Fig. 4.—Diagram shewing the comparative brilliance of:—1. Emerald Green. 2. Chromous Oxide. 3. Terre Verte. (Adapted from Abney.)

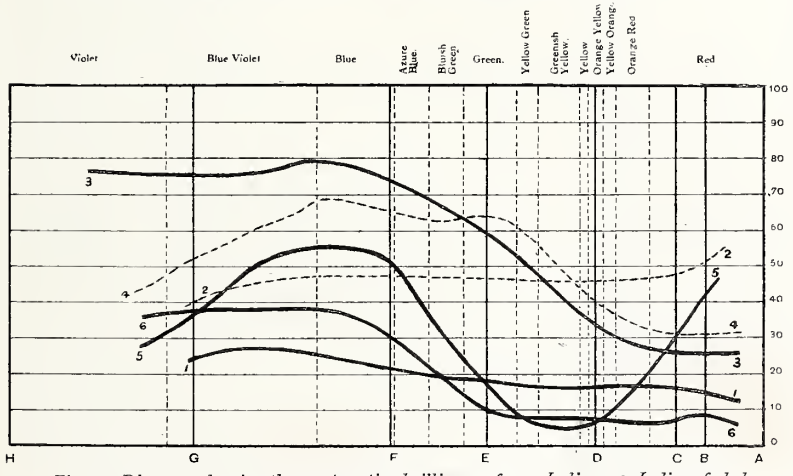


Fig. 5.—Diagram shewing the comparative brilliance of:—1. Indigo. 2. Indigo, faded. 3. Antwerp Blue. 4. Antwerp Blue, faded. 5. Cobalt. 6. French Ultramarine. (Adapted from Abney.)

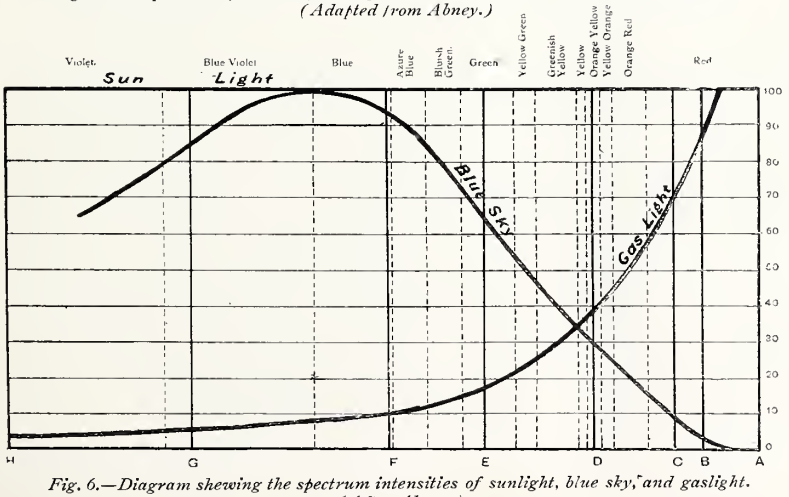


Fig. 6.—Diagram shewing the spectrum intensities of sunlight, blue sky, and gaslight. (After Abney.)

undoubtedly a low-toned greenish-blue, and when faded is still greener and more luminous.

Another diagram (fig. 6) is necessary to assist in the demonstrations of chapter XIII., and at the same time to still further elucidate the ideas of luminosity of light and pigments. In this is shewn the comparative intensities of sunlight, blue sky, and gaslight. By inspection it will be seen that blue sky at one part of its composition is equally brilliant to sunlight, but it falls away so rapidly towards the yellow end that its brilliance soon stands in a poor comparison with sunlight. Blue sky owes its main brilliance to the quantity of blue in it, whilst gaslight contains but little blue light, and rises into brilliance by the presence of its yellow-orange and red rays.

DOUBTLESS the present year will be prolific in invention and developments of scientific and trade processes. *Anthony's Bulletin* believes that amongst the good things the year may bring will be a simple method of etching aluminium, or of stereotyping with it, so as to allow of cuts being sent by post. The experiments with aluminium are not by any means wholly satisfactory as yet, but the difficulties may doubtless ere long be spoken of in the past tense. To follow this point in another direction, lithography offers special advantages for the printing of half-tone pictures with pure high lights and soft gradations. The combination of both will be an event of the year.

A Difficulty Overcome.

ORDNANCE SURVEY OFFICE:
ZINC PLATE BEDS.

THE following particulars of a cast-iron bed for holding both thick and thin zinc plates have been forwarded by Mr. James Mortlock, Superintendent of Machinery, O. S. Office, Southampton. He says:—

It is thought that the arrangements in use at this office for gripping both thick and thin zinc plates, on cast-iron beds fitted to ordinary litho machines, may be of general interest.

For various reasons, all the work done here has been on zinc; formerly thick zinc plates three-sixteenths of an inch thick were used, but lately thin zinc plates ·02 of an inch have been used.

The litho machines in use here are a quad-royal and double-crown, and both of these have been fitted to take either thin or thick zinc plates. The result has been most successful, as either thicknesses of plates can be fixed ready for work in less than a minute.

The arrangements for gripping the thick plates, which in the case of the quad-royal have been in use for eight years, and in the double-crown for one and a half years, are as follows:—

Fig. 1 shews plan of bed one-tenth its actual size; the sections are one-fifth actual size. Fig. 2 shews a section through A B on plan, with thick plate ready for gripping. The back gripper (K on plan) is secured to a steel shaft on each side of the bed (see fig. 3 section through C D on plan); a gun-metal horned nut is fitted to one end of each shaft, and the gripper is fixed to each shaft with a pin (see fig. 3); when screwing up the nuts, they bring the gripper up to the edge of the bed, and hold the plate in position on that side. Two fixed grippers (L M on plan) are also supplied, one to the front, and one to the side of the bed; a movable gripper (N) is fitted to the other side (see fig. 5 section through E F on plan), this gripper is tightened up by one horned nut and forced back by two springs, in the same way as the back gripper.

When fixing a plate it should be forced home to the fixed grippers, the movable ones are then brought up to the plate by giving the three horned nuts a few turns.

When removing a plate the three nuts are unscrewed a few turns, the grippers are then forced back to their original position by four springs (see section C D, fig. 3, and side movable gripper on plan).

The alterations to allow of thin plates being also gripped have only lately been carried out. The thin plates are fitted into the beds over thick ones (see fig. 2); before securing the thin plates, the thick ones should be gripped at the front and both sides.

When carrying out the above-named alterations it was found necessary to supply the third movable gripper to the beds (see O on plan). It is fixed to an iron frame on the front of the bed, and carried by two plates rivetted to the frame (see fig. 6 section through I J on plan). When fixing these plates, one side is placed in the slot of the back gripper (K), the two horned nuts are tightened up, the thin plate is then jammed tight on to the bevel of the thick one, which secures it firmly on that side. The plate is then slightly bent and sprung into the jaws of the front gripper (O); the five nuts (P on plan) are then tightened up, which draws the inner jaw of the gripper into the outer one, the plate is then secured firmly between the two jaws. The five nuts (Q on plan) are then tightened up, which draws the thin plate perfectly flat and tight on to the thick one.

When removing the plate, a few turns are given to the two horned nuts of back gripper (K) and the five nuts (P on plan), the inner jaw of gripper is then forced back by four springs (see fig. 4 section through gripper G H on plan). The five nuts (Q) are then released, and the gripper is forced back to its original position by the four springs (R on plan).

When fitting up the bed on double-crown machine, three bolts were found sufficient to hold the plate firmly. In all cases when printing from thin plates, the side grippers on the beds are not required. The whole of the fittings are fixed to the beds, so that the adjustment is not interfered with in any shape or form.

To thoroughly understand the mechanism it is advisable to read the matter most carefully, and study it with the plates close by. The absence of reference letters on figs. 2, 3, 4, 5, and 6 opens a difficulty, which is increased by the difference in scale between fig. 1 and the others, and the necessity of bringing all the figures into a symmetrical disposition, somewhat disjoints them from the parts to which they refer.

The whole arrangement shews that a large amount of skill and thought has been utilised to make what seems almost a perfect zinc plate bed. Undoubtedly it has cost much experimenting to obtain the result, and it is a great boon to the printing world to have this contrivance placed before it. The accompanying plans are from transfers supplied by Mr. Mortlock.

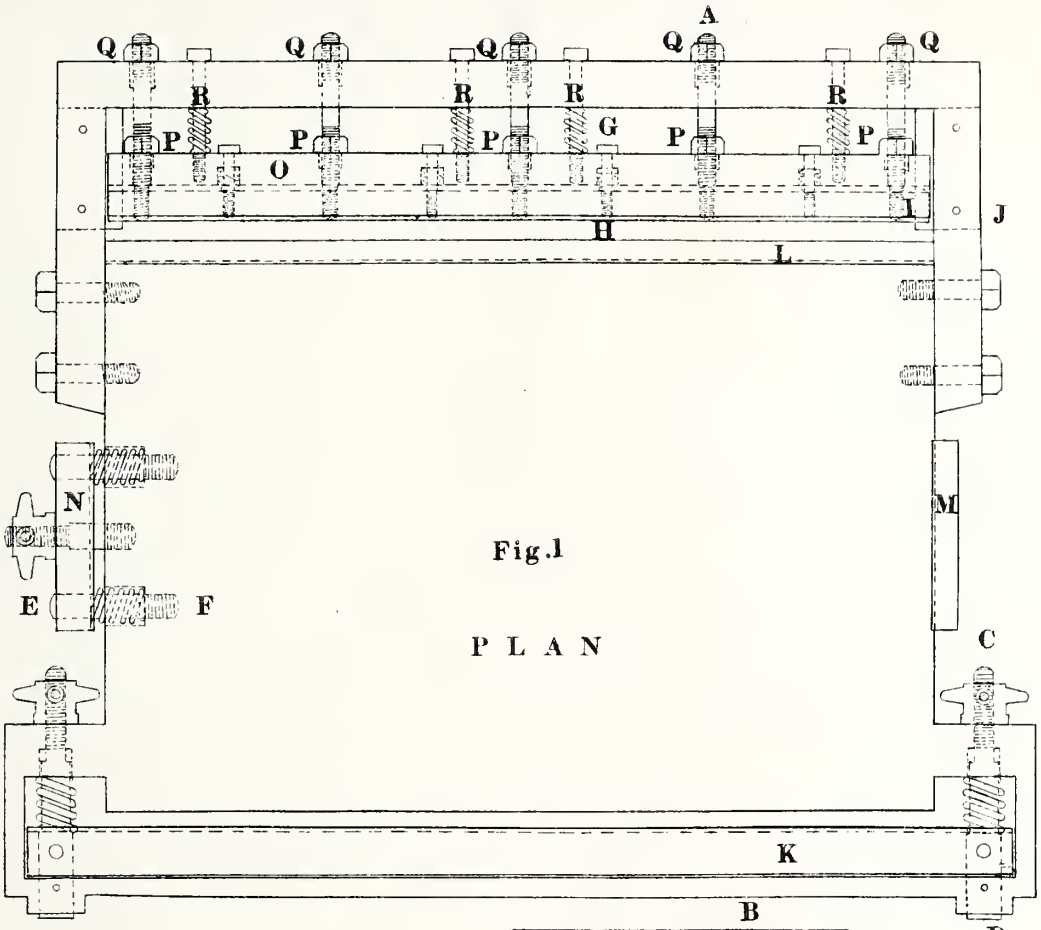


Fig.1

PLAN

Fig.2

Fig.4

Fig.3

Fig.5

Fig.6

PLAN OF BED FOR HOLDING THICK & THIN ZINC PLATES.

German Collotype Printers.

CONTINUING our specially compiled descriptive list of collotype houses—with a view to shewing British workers the growth of foreign production, and the class of work undertaken by these firms—we give a second instalment of names and particulars.

IN DRESDEN,

The Royal Saxon Court Photographers, Römmler & Jonas (Emil Römmler), possess twenty collotype steam presses, and are perhaps the largest house in this particular branch. The staff varies from 80 to 110, according to the season. The branch chiefly cultivated is monochrome collotype, varied adaptabilities of the process being continually forthcoming. The firm also publishes several thousand views.

Stengel & Markert have had an establishment for collotype and heliogravure since 1885, working both on their own account and to order, and doing a good export trade. A speciality is made of colour collotype. The publications include reproductions from the Industrial Art Museum and the Ethnographical Museum at Dresden, and souvenir albums, of which the catalogue mentions more than eighty.

Two of the younger houses in Dresden are Hermann Poy and Nenke & Rolle, each working with two presses.

LEIPZIG

naturally employs a number of collotype printing offices of considerable dimensions; among the first is Sinsel & Co., established in 1885 for collotype, autotype, and zinc etching. They confine themselves to ordered work, principally *editions de luxe,* scientific books, catalogues, and pattern sheets in glazed, unglazed, and three-colour printing. They have at present twenty-six employés, six steam and two hand collotype presses. The establishment will, however, soon be enlarged with a special view to greater facilities for three-colour printing on their own system. The house exports to England, Switzerland, Holland, and Scandinavia.

The house of C. G. Röder, music engraver and printer, added collotype to its other branches in 1891 by taking over the business of C. Hesse. The departments of the firm now embrace music engraving and printing, lithography, photolithography, letterpress printing, and electrotyping. The staff consists of no less than 780 persons. The rapidly developing collotype department gives employment to twenty assistants, and operates four steam and two hand presses. The collotype work consists chiefly of designs in architecture and industrial art, as well as views of towns in glazed collotype.

Heuer & Geyer, photographers and collotype printers, employing twenty workmen and three steam presses, do all kinds of collotype work.

One of the oldest collotype printing establishments in Germany is the one which was founded by Naumann & Schröter, and then passed in 1874 into the hands of Julius Klinkhardt, who is chiefly known as a great letterpress and lithographic printer and typefounder. The collotype department works with eight assistants, three steam and one hand presses. The work includes scientific and other collotype prints, plain or coloured, but only to order.

Meissner & Buch, the chromographers, erected a collotype department in 1886. Their catalogue of colour collotype prints quotes sixty-nine facsimile reproductions of the works of the best artists on Meissner's own patent process. The specimen plate in the catalogue from Alberti's "Venetian Fishermen" affords evidence of the practical and effective character of this process for reproducing water-colour and oil paintings. The firm exports to the various European countries and North America.

Aarland & Müller, established in 1850, devote themselves to all classes of collotype work as well as zinc etchings, autotype, retouching of old copper plates and paintings, and enlargements from small photographs.

To the larger collotype houses of

STUTTGART

belongs the collotype and lithographic printing firm of Carl Ebner, established in 1817, and working with a staff of twenty-five to thirty hands, and five steam presses. The collotype branch, among other work, is devoted to reproductions of architecture and industrial art for the publishing trade, and to the get-up of manufacturers' catalogues. The house exports to England, France, Belgium, and Holland.

The Court art house of Martin Rommel & Co., established in 1870, works with twenty-two employés and six steam presses, turning out collotype prints in one or more colours, principally for German and Austrian publishers. They also export to England and Belgium.

E. Schreiber, established in 1882, has two steam presses for collotype and zinc etching. C. Rübsamen (1870) added a collotype branch in 1890 to his former branches for lithographic and letterpress printing.

HAMBURG

also possesses a number of large collotype houses. Carl Griese, established in 1880, is well known for his reproductions of some of the most popular works of C. W. Allers—"Club Eintracht," "Silberne Hochzeit," and others. Carl Griese enjoys a high reputation for his achievements as technical master at the Technical School of Hamburg, and has been distinguished by the award of the silver

medal for achievements in collotype printing, and the gold medal for the invention of an automatic photographing apparatus. Besides collotype the house executes zinc etching, autotype, and photo-lithography. The staff consists of twenty assistants and the plant of two steam and six hand presses.

Among the collotype printing offices of Hamburg we have further to mention the house established in 1889 by Knackstedt & Näther, and now in the sole possession of Ludwig Knackstedt. The firm gives employment to six assistants, one steam and six hand presses, and chiefly does industrial and artistic work, landscapes and the like. An important publication of the firm are the photos of the great North Sea and Baltic Canal, taken at the instance of the imperial commission for that great work. The house also exports to England and South America. The collotype branch of F. A. Dahlström was established in 1887. With four presses and a staff of twelve to fifteen persons, the firm executes collotype and photo-litho reproductions of works of art, particularly pencil drawings, art and industrial objects, either from drawings or from nature. G. Koppmann & Co., established in 1865, work with three assistants and three hand-presses, and make a speciality of landscapes and three-colour prints. The views of Hamburg, published by this house, are of particularly excellent workmanship. The Verlags-Anstalt und Druckerei A.-G. keeps three collotype presses employed on its own account. Jean Holze, established in 1879, has a collotype department for catalogues and similar work.

IN LUBECK

we have first to name Joh. Nöhring, established in 1872, and Ernesto Tesdorpf, dating from 1892, each firm having its own photographic studio. Nöhring devotes himself less to ordinary catalogue work than to higher class reproductions of pictures, photos of architecture and landscapes, both on his own account and to order. The catalogue of his publications, extending over twenty-four pages, contains numerous masterpieces of architecture, sculpture, painting, and industrial art. The firm does an export trade to England, Russia, France, and Belgium. Ernesto Tesdorpf, who also works in photo-lithography, zinc etching, and electrotyping, supplies reproductions of copper-plates and sketches, the subjects being Italian sculptures and the like. Tesdorpf has also issued the famous "Dance of Death" of Lubeck.

* * * * *

THE Ashton Photographic Society scored heavily in its Triennial Exhibition held in the Town Hall, November 12th to 17th. Over 1,500 pictures of a high order of merit, and a variety of instruments and illustrations of photo-mechanical methods, etc., were shewn. Evening lectures and demonstrations were attended by large and interested audiences.

ENCOURAGEMENT FOR WOOD ENGRAVERS.—In his paper on "The Influence of Process on Illustration," compiled in connection with the Photographic Exhibition at the Aquarium, Mr. H. Snowdon Ward deals with the influence of process on the wood engraver. He says that the wood engraver has been so largely and so rapidly supplanted by process, that it has been stated he was already entirely swept out of existence, but this is far from actually being the case. The wood engraver has been obliged to adapt himself to new conditions, and many branches of his work have almost entirely left him, but there are some directions in which he still holds the field, and in which it is quite unlikely that process can successfully compete. An example of this is in the engraving of machinery and similar work, in which it is impossible for a half-tone production from a photogram to give anything like the life and brilliance that an engineer requires, and in which the pen and ink draughtsman for line work seems at present to have no chance against the wood engraver. There are indications also that wood engraving will recover, to a certain extent, its place in high-class illustration, for the art of the wood engraver is undeniably an art, and has in itself advantages that no process can copy.

* * * * *

A NEW PIGMENT has recently been much talked about in scientific circles, which is capable of being prepared in three distinct tones of colour —yellow, dark yellow, and orange. The beauty of these colours lies in their permanency, but, as it appears to possess but very little covering power, it seems likely to find its chief use for blending purposes. According to *The Pharmaceutical Era*, the pale shades are prepared by simple precipitations from solutions of uranium nitrate by strontium hydrate, the former being kept in excess. Although temperature and concentration are apparently without influence on the tone of the colour, it has been found desirable to conduct the precipitation in the cold. The darker pigments are precipitated from a ten per cent. solution of uranium nitrate, a considerable excess of strontium hydrate being employed. This is done in the cold, after which the whole is boiled for some time. By heating the dark yellow colours to 200 degrees to 250 degrees C., it is converted into the orange pigments.

* * * * *

OUR men are thoroughly pleased with the past numbers. May you keep up to the excellent standard you have set up. It is a splendid one. —CHARLES S. GODBER, 83 Austin-street, Wellington, N.Z.

CANNOT do without the new and varied information you give.—ANDERSON & Co., Portland, Or., U.S.A.

General Trade Report.

It is with no small degree of delight that we are able to report that employment in the printing trades maintained its good position during November and late into December. The percentage of unemployed in October was 5·1, which fell to 3·7 in November, and only rose to 4·5 in December, as against 6·1 in December of 1893. Trade in January has opened well, the standard of employment has been kept up, and only from Dublin do we get really discomforting rumours.

At Dublin trade is bad. The last ten years have witnessed a more rapid decay in lithography than has ever been witnessed in any other city or town. Large firms have entirely collapsed. New ones have arisen and collapsed also. Dozens of lithographic machines have been covered up, and nearly thirty artists have had to find occupations elsewhere. What is the cause is very hard to determine. The facts are there, and for the present Dublin is entirely out of the competitive world in lithography. There seems to be an absenteeism of patriots as well as landlords, for several large firms, or their cute (?) managers, are delighted to send the work—not into England, but Germany.

Trade in London is getting cut to a fine shade, and firms are taking work to keep going at mere cost, rather than stand idle. They seem to forget the adage, "It is as well to play for nothing as it is to work for nothing."

In general towns, the following brief summary represents the state of trade all over the country:—

ABERDEEN.—Letterpress still very bad, with ten per cent. unemployed. Lithography declining, with six per cent. unemployed.

BELFAST.—The trade generally is only quiet.

BARROW.—General slackness is marked by a moderate improvement.

BIRMINGHAM.—The trade maintains its usual steady average. Artists are not in demand.

BOLTON.—The general trade is fair.

BRADFORD.—The trade has shewn a considerable falling off; especially lithography.

BRISTOL.—Letterpress brisk. Lithography fair. Artists fully employed. Bookbinding declining.

BATH.—The trade is generally depressed.

CARDIFF.—The trade is still in the same steady state.

CARLISLE.—Continues with a good trade all round.

CORK.—The trade as a whole shews a decided decline.

DERBYSHIRE.—Letterpress good. Lithography very quiet, with eight per cent. unemployed. Bookbinding dull.

DUBLIN.—Letterpress fair, with large number unemployed. Lithography very bad. Bookbinding good.

DUNDEE.—The trade in all branches is very satisfactory.

EASTERN COUNTIES:—*Norfolk*—The trade is generally busy. *Ipswich*—Printing is in a low state, with ten per cent. unemployed.

EDINBURGH.—The trade generally is good. Type founders working five days per week, instead of four days.

GLASGOW.—Letterpress very dull. Lithography shewing no decline on its improved condition. Bookbinding good.

HANLEY.—Letterpress declining, with as much as eight per cent. unemployed. Lithography retains its moderate state. Bookbinding fair.

HULL.—The slack trade of November has shewn a change for the better.

LEEDS.—Letterpress is good. Lithography shews a decline, with one and a half per cent. unemployed.

LEICESTER.—The whole trade is marked with improvement.

LIVERPOOL.—The trade all round has retained its steady position.

LONDON.—A fluctuating trade at low prices still continues.

MANCHESTER.—The depression of November has given place to an improvement in all branches.

MIDDLESBROUGH, ETC.—Printing trades have been busy, but now falling off.

NEWCASTLE.—Letterpress slightly improved, with 5·4 per cent. unemployed. Lithography and bookbinding moderate.

NOTTINGHAM.—Letterpress quiet. Bookbinding good. Lithography improving, except with the artists, who shew three per cent. unemployed.

PLYMOUTH.—Printing trade generally quiet; many unemployed.

SHEFFIELD.—Letterpress improving, with five per cent. unemployed. Lithography quiet, with about two per cent. unemployed. Bookbinders fully employed.

WOLVERHAMPTON.—Printing still good, with two per cent. unemployed.

OLDHAM.—Printing has been slack, but improving now.

ACCRINGTON.—Printing has kept steady and fairly good.

The general trade of the country is shewn most clearly by a tabulation of statistics. Thus:—

	No. of Societies making returns.	Total No. of members.	Total No. unemployed.	Percentage unemployed.
Oct. 1893	26	—	—	7·9
Oct. 1894	57	358,507	26,404	7·4
Nov. 1893	32	—	—	7·2
Nov. 1894	62	362,091	25,178	7·0
Dec. 1893	32	—	—	7·9
Dec. 1894	67	367,796	28,484	7·7

Fourteen of the societies in December, 1894, had ten per cent. and over unemployed. Pauperism, too, shews a slight improvement, for by comparison there were three in every 10,000 of the population less at the end of 1894 than in 1893. The following table gives the full figures:—

No. of paupers relieved on one day in	No. per 10,000 of population.
Oct. 1894	315,277	215
Nov. 1894	325,884	223
Dec. 1894	335,634	229
Dec. 1893	339,511	232

In every respect 1894 closed in a far more improved state than 1893, shewing that the great strikes in 1893 had at last begun to be lost sight of; and from the effects of a quiet home but decreased export trade, the whole country is marked with improvement.

DERBY.

THE collotype trade remains very satisfactory both as regards present work and the immediate future. The general lithographic trade is, however, depressed, and the conditions are far from encouraging. The Society reports two out of its twenty-six members unemployed.

AT the Trades Council meeting for election of officers, on January 9th, Mr. Wm. Clarke, A.S.L.P., was re-elected Assistant-Secretary. Councillor T. H. Wigley, Typographical Association, retired from the office of Treasurer, and was awarded the hearty thanks of members for the manner in which he had fulfilled the duties of the office.

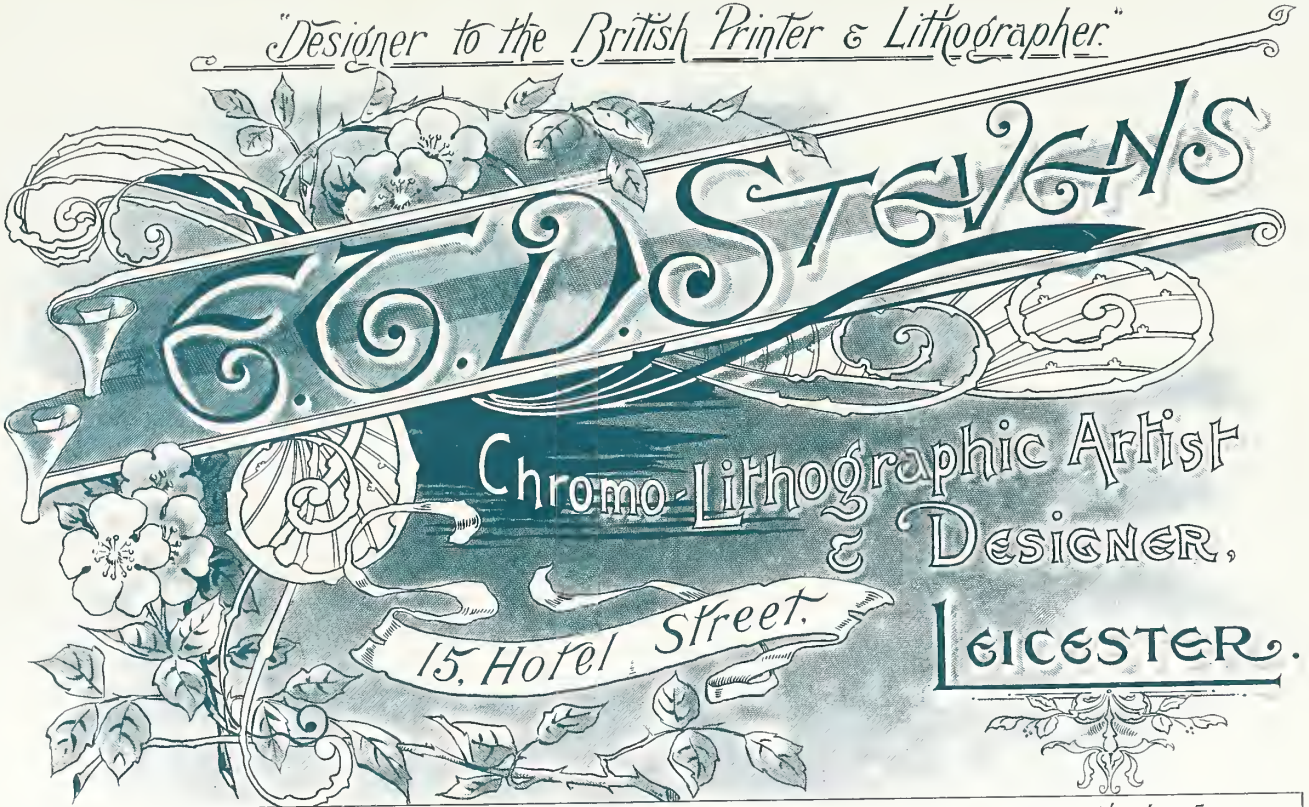
Book Notes.

THE "International Annual of Anthony's Photographic Bulletin."—The seventh vol. is now before us, and without any doubt it is the smartest photographic annual published this year. The specimens of photography upon Aristo-platino paper are simply excellent, though it is possible some of its possessors may object to this statement, because they may unfortunately have purchased copies in which one or both of the examples are a little over-printed. The "Child," looking upwards, is an artistic and first-class production. The annual is replete with models or poses for the photographer's room, and cannot fail to render good service in that direction. The artist and designer, too, can find in these plates natural copies of elegance in drapery and figure, which it would be difficult to excel. The reading matter is almost entirely devoted to the photographer, some of it savouring of the old photographer anxious to lead the young into useful paths, and not forgetting to bait the would-be photographer who is springing up and taking snap shots at every mortal thing, from a coal mine to the summit of Mount Everest. Nevertheless, the photo-lithographer and photo-etcher will be well repaid by a perusal of the following articles:—"Collotype for Amateurs," "Half-tone Engraving," by M. Wolfe, "Asphaltum for Etching Blocks," "Three-Colour Illustrations 'in Monochrome,'" "Printing in Natural Colours," "Colour Screens." The style of the annual is all that can be desired: 350 pages of reading matter, well printed on good paper, embellished with some twenty full-page illustrations, including the two actual photographs; the plates are printed in first-class style; the whole volume being one which every patron of the "light art" should certainly have upon his shelf.

"The Year Book of Photography."—This volume comes up as an annual dish, in the same old form, of which very little can be said in its favour. There are some 400 pages of not over-well printed reading matter, with five full-page plates, fair in their way—in fact, two are excellent. One plate of cloud photographs (opposite p. 264) is spoiled by being printed on a paper which shews the web most distinctly and destroys the whole effort of the photographer. Amongst the many semi-interesting articles will be found:—"Photo-Etching on Copper," "Painting in Monochrome," "Photo-Mechanical Methods," "Stripping and Enlarging Films," "Izal," "Blue Prints," "Orthochromatic Photography," and "Edison's Kinetoscope," most of which must have more than a passing interest to lithographers who are attempting to keep pace with the times by widening their own capabilities as photo-lithographers and photo-etchers.

"British Journal of Photography Almanac, 1895."—This mass of literature, this record of all that is new, this compendium of photographic suppliers and supplies, is as large as ever with its 1,345 pages. The suggestion has been made before that it should be bound in two parts, but still the publishers adhere to the old cumbersome form. Many readers probably follow our example by tearing out the body of the work and keeping the advertisements separate. To some the advertisements are the best part, and to all, advertisements are the only way in which the public can get to know everything about everything, and keep abreast of the times in matters technical and scientific. The annual contains about 350 pages of readable matter, not too well printed, and on a paper which is not likely to last many ages. There are four full-page plates in half-tone, which cannot claim any merit at all. Another full-page plate is a print on "Barnet" bromide paper. The print in the copy under review is not by any means a good production, and does not equal bromide prints which have appeared in other journals and annuals. But the plate of the whole book is the direct three-colour process photo-chromographic block print by Messrs. Waterlow & Sons, of London. The copy now before us is out of register, and allowing for that, there is certainly fair work to be discerned in the production of the "Jar of Flowers." It may be that being out of register gives an effect which makes the flowers look so soft and almost natural. The plate is a lesson for others following the same bent, and just marks the steps by which the process is gradually evolving.

Amongst the numerous articles the following may be selected:—"Impediments to Heliochromy," "Staining Gelatine Emulsions," "Intensification of Process Negatives," "Chromo-photography," "Steel-facing Photogravure Plates," "Reversing Negatives by Plener's Method," "Tone Etching," "M. Lippmann's Process of Photography in Colours," "Photogravure," "Mr. F. E. Ives on the Lumière-Valenta-Lippmann Colour Photographs," "The Yellow Screen," "The Copyright (works of art) Act," forming a most interesting series of papers for special study, as well as a general knowledge of how the photographic world is rapidly advancing to fill up deficiencies in lithography and other modes of printing, as well as assisting draughtsmen to a true and accurate appreciation of the world before them.



Printers, Compare!!

"The above is a specimen of my new method of producing "American Style" Bill-Heads, Invoices, Cards, etc. at about ⅓rd the price of a similar Plate."

GEO. NEWNES' (LTD.) PUBLICATIONS.—With the old-standing weekly "**Tit-Bits**" and the well-established "**Strand**" most people are very familiar; but the latest ventures from this enterprising publishing office are not so well known, and deserve special remark. "**The Strand Musical Magazine**" (published monthly) is an excellent record of the musical world, and it also contains a fine budget of good class music adapted for the pianoforte, etc. It is a work which should create a healthy patronage.

Another work is the "**Tour Round the World,**" in twelve parts, each containing twenty-four pictures, and published at sixpence per part. This publication is uniform in size and style with the "Stoddart's Portfolio," and possesses the advantage that it can be bought at sixpence without a coupon. The photo-etchings are brilliant productions, vieing with those of the Portfolio above mentioned. As a series of views, artists can make a most extensive use of them for architecture and figure work, besides keeping them as an album of the world.

The "**Picture Magazine**" is a curious and most interesting publication. In it may be found illustrations of latest occurrences, first-class studies of animals, and pictures from ancient sources depicting the unfinished state of many things which have been brought to perfection in recent years.

The "**Strand Magazine**" loses none of its original freshness, and the publication of another series of articles by Conan Doyle will undoubtedly conduce to an even larger circulation than at present.

Besides these larger publications, there are the *Strand Novelettes, Christmas Picture Books,* and *The Million,* all coming from the same office, whence issues also the *Westminster Gazette* every afternoon. Scarcely anything of such a scale has been built up in so few years, and the Baronetcy recently conferred upon Mr. Newnes is not at all ill-placed, after the large amount of benefit he has conferred upon the public.

"**The Process Photogram.**"—This new publication, which has been in preparation some time, is now before us, and consists of the ordinary issue of the *Photogram* with a twelve-page section inserted, devoted wholly to process work. The articles in the first part are:—"The Enameline Process," "The Use of the Router," "Possibilities of a Direct Process," "Photo-Chromotype," "Review of George Fritz's (Vienna) Work on Photo-Lithography," "Photo-Galvanography," and a number of useful notes. A glance at this list shews that in the one number there is as much as is usually to be found in a complete photographic annual on the matter affecting our trade. With this also is given a chromotype production in four printings, from blocks prepared by Messrs. Hare & Co., and printed at our publishing offices. This production is equal to anything of its kind produced at the present day, and shews in a marked degree the excellence which can be attained in "three-colour" block printing.

THE Feb. number of "**In Town**" is decidedly the best issued. The stories are capital, and the numerous illustrations first-class.

"ONLY BEEN OFF TWICE."

From "In Town."] [*By kind permission.*

Designing Paper-Hangings.

In a recent issue of *The Studio*, Mr. Walter Crane discourses to an interviewer concerning his share in the production of paper-hangings, and during the course of the conversation some interesting information relative to British *versus* American skill is elicited. Queries the interviewer :—

"What do you say of the relative merits of the craft in the two countries, England and America?"

"In my opinion, we are decidedly superior. In the case of the design I made for an American order, the block-cutters out there had serious misgivings as to whether they should be able to execute my cartoon; and so I had to furnish a duplicate set of drawings in black and white, with sharp lines, and all in exact precision for the guidance of the cutters."

"What was the design in question?"

"It was one that was drawn specially with a view to exhibition at Chicago. The scheme comprised allegorical figures, ships, etc., representing the four quarters of the globe."

"That sounds as though it was rather elaborate."

"Well, not more so than the majority of my designs for Messrs. Jeffrey & Co. Speaking generally, it does not seem to have been worth anyone's while in America to cultivate the art of wall-paper design and manufacture, as we have done in this country."

"Am I to understand that it is not the custom to use wall-papers over there to the extent we do in England?"

"On the contrary. The demand is great, and the manufacturers are so numerous and influential a body that they have formed a ring for excluding imported papers."

"Is that course likely to be for the advantage of the country?"

"Certainly not for the interest of art, whatever it may be for business."

"You mean that the American designs are not up to the standard of our own?"

"They are not. The fact is, the manufacturers do not scruple to pirate our wall-papers very largely. It is the more unfair because the patterns —by no means improved in the process of reproduction—are then palmed off as though they had been printed at first hand from some well-known artist's cartoon, if not actually under his immediate supervision. The facilities for pirating are such that there is no inducement for the manufacturer to purchase designs, as is commonly done in England, expressly from first-rate artists. And as to those of their papers which may be described as original, they appear to be designed for the most part by some member or other of the regular staff of the several firms."

"What of such artists as Mr. Tiffany or Mr. John La Farge? Are they not general decorators?"

"Yes; and of course, like our English decorative artists, they undertake various branches of design—paper-hangings among others, I believe; but these men are exceptions to the ordinary rule and the whole thing is on a totally different footing in America. With them decoration appears to be simply and solely a matter of business, and the American artists themselves regard and speak of it as such quite frankly."

"Did you perceive any signs of a distinctive style in American art?"

"I may say yes with regard to architecture. I refer to that which is associated with the name of Richardson. He has not been dead many years, but he has a considerable following; though I am afraid there are scarcely any with his capacities. There is a certain vastness and grandeur about their larger blocks of buildings, but many of the details of carving, etc., struck me as being poor and superficial. I do not quite know how far this class of work ought rightly to be reckoned as native, for in the workshops I visited I noticed many foreigners employed, particularly Germans. Their recent timber country houses are the prettiest things they do, and most characteristic."

"Do the Richardson school of architects make a point of designing all the interior fittings and decorations in keeping with the houses they build?"

"As a rule, I should say not. These matters are mainly regulated by fashion."

"It varies then, just as is the case with us?"

"Yes, exactly; only in America the rage for this or that particular style does not last so long, and the transition from one 'period' to another takes place even more rapidly than in this country; but, of course, the 'periods' come from Europe."

ARTISTS will be interested to learn that the greatest cost in making first-class lead pencils is not in the wood, even when the smoothest and straightest grained cedar is used, nor in the finishing and stamping of the pencils, though the finest varnish and purest gold are employed. The greatest cost is in the time and labour spent in manipulating the materials of which the lead is made. The materials used in making such leads are the finest and smoothest graphite and clay. The graphite is specially selected for the purpose, and is most carefully floated through water time and again, which allows the grit and coarser particles to sink and become separated. The clay is also subjected to similar thorough and careful treatment. The proportion of clay determines the degree of hardness; and, therefore, in order that the leads may be uniform in hardness as well as toughness, long-continued grinding and mixing are necessary, as well as other painstaking operations, before the leads are perfected and ready for the wood and finishing processes.

Trade Notes.

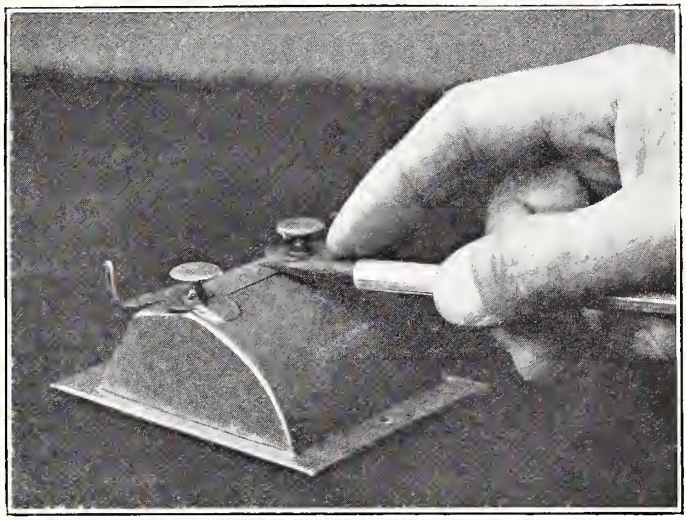
EFFECTIVE to a remarkable degree, the new **Paper Maturing Appliance for Litho Machines** (Jubb & Chalmers' patent) only requires to become known to become popular. Messrs. G. Mann and Co., Leeds, will supply full particulars.

VARIOUS samples of plate ink, retransfer ink, and writing ink, with specimens of the leading transfer papers made by **Mr. George McIntosh**, 64 Paterson-street, Glasgow, have been sent us for examination and comment. We have put the whole of the samples into actual operation, and, after careful tests, are pleased to report that no more satisfactory set has ever reached us. The plate transfer paper gave perfectly clear transfers on stone; the retransfer paper, specially intended for stone and type, proved equally valuable, and the beautifully rolled writing transfer paper fulfilled all that was claimed for it. Besides this, a thick writing transfer paper is specially prepared for plans, pen and brush work, and a fifth transfer paper, described as unstretchable (rolled), is admirably designed for colour work. A transparent transfer paper is specially prepared for colour work by the cold damp stone process.

Mr. McIntosh possesses long experience in the manufacture of inks and papers for the transferrer. He has been connected with the litho trade for some forty years, and recognising that the age is one of division of labour, has wisely devoted his attention to this section, and in which he has attained splendid results. Being experienced as a practical worker, he knows exactly what is required, and our friends would find it mutually satisfactory to obtain samples of his goods, and give them a fair trial. His trade announcement will be found on another page.

THE National Society of Artists has been for some time involved in the practical teaching of art at its studio, 35 Clerkenwell-road. The matter has been placed before the London County Council, and having money to use for technical instruction, they have granted the National Society the use of the old Stationers' School in Boult-court, Fleet-street. Furthermore, the Institute is being fitted throughout with the electric light and all the necessary apparatus for practice in the photo-mechanical work, now so common in the trade, and the L.C.C. have promised a substantial sum per annum for the maintenance of a proper staff of art teachers at this trade art studio.

DECIDEDLY the simplest and most cleanly method of sharpening crayons and charcoal in use, "**Beaumont's Patent Sharpener**" should find its way into all artists' rooms. The apparatus is a cylindrical hollow box composed of polished brass, the elongated flat base being well adapted for affixing to a table or easel. At top of the box —about one inch high—is a horizontal steel blade maintained in position by a couple of finger screws, and a handy lever is attached to raise the blade when necessary. The action of sharpening the crayon is shewn in the accompanying illustration, which also gives a good idea of the apparatus itself. From a lithographic point of view, the sharpener submitted for examination is a veritable boon to lithographic artists using crayon for small work, and is equally indispensable for large work.



Our tests gave entirely satisfactory results—so much so, that we are convinced the apparatus only requires making known to become very popular. Those who have used it have formed high opinions of its value. It may be obtained from the manufacturer, Mr. E. Charles, 73A Houndsgate, Nottingham, price 1/6.

"LAW'S OFFICE ALMANAC," from the office of Messrs. W. W. Law & Sons, Northampton, is a tasteful card in gold, two colours, and a tint (12 × 7-in.). The upper portion of the design includes matter relating to the business of the firm, a coat of arms in bronze, a cross panel bearing title in red, shaded with gold, and scroll bearing postal information. The lower portion is devoted to the 1895 calendar, and is printed in black, with gold borders, on pale buff tint. Besides being very welcome for office use, the calendar is effective as a business announcement.

Our Prize Competitions.

OWING probably to the intervention of Christmas, the number of competitive designs is rather lower than usual, and—must we add—the quality is distinctly lower. It seems a pity that those who have sent in designs on this occasion have not entered our previous competitions, because the designs shew a great lack of that ingenuity and novelty so necessary for the subject in hand. If the competitors had turned over to their own collection of New Year's cards, and had asked themselves if they would like to receive a New Year's card of a similar design to that which they have submitted in this competition, the answer would certainly be "No" in four cases out of the six. There is, no doubt, considerable skill expended upon the drawings, and in ordinary competitions, such as those in design and drawing, the work would have run the leaders close.

The most original design, and one which is also well drawn, is that sent in by

MR. P. V. MACENANEY,
84 Stratheden-street, Belfast,

to whom the prize is awarded.

The second design is by "A.E.O." There cannot be any claim to originality in this design—it seems very familiar, but the whole execution, arrangement, and lettering would be very acceptable and pleasing to anyone as a New Year's card.

The third design, by "Graver," is certainly a good card, but not by any means over-appropriate to the occasion. The figure is defective in the length of the arms and shin. The arms of a man or woman when stretched down the side are so long that the tips of the fingers are only a few inches from the knee pan. The scythe is in such a position that it seems to form a part of the ornamental scroll, and is practically lost as a scythe. The lettering is very well written, and the pen-and-ink work is excellently designed for process-block production. The motto bears repetition, and runs as follows:—

> May the year but just begun bring thee peace and rest,
> And may every setting sun find thee still more blest.

The fourth design, by "W.C.," cannot be looked upon as anything beyond an ordinary label design, and quite unsuited in every way as a New Year's card. The drawing is very fine, and shews excellent workmanship; but, there again, the majority of photo-block makers would complain that the work is really too fine for their processes, and could not be reproduced to do justice to the original.

The fifth design, by "Aristotechnees," is a repetition of the well-worn idea of the ancient year giving place to the youthful year, impersonated by the old and the young man. Some parts of the card are well thought out, especially the capital "N," with the hour-glass and wings; but the design is marred by the over-elaborate drawing of the old man, the want of symmetry, and the absence of really accurate figure drawing.

The sixth design, by "G. McC.," has the essence of something in it, but what this is has not become apparent in the design. It is worked out on the old lines of the old year (an old man and an old lamp), overshadowed by the strong fresh light of the new year (a young man and a new lamp). But whilst this shews some good drawing, there is also some of an indifferent character, and the whole is spoiled by a want of cohesion—not necessarily symmetry.

The prize design is reproduced on another page.

COMPETITION J.—We offer a prize of

ONE GUINEA

for the best design suitable for a

BOOKMARK.

The design to be in black ink on white card, and drawn in a manner suitable for zinco reduction to about 6 × 1½-in.

RULES.

1.—All designs may be signed with a *nom de plume*, but the correct name and address of each competitor must accompany each design submitted.

2.—All designs for competition must arrive on or before Monday, March 11th, 1895. The award will be published in the April-May issue.

3.—Competitors should address designs for competition to The Editor, BRITISH LITHOGRAPHER, De Montfort Press, Leicester, and envelopes should be marked "Prize Competition" in the top left-hand corner.

4.—The decision of the Editor must be final.

5.—The Editor reserves to himself the right to reproduce any design sent in as worthy of mention besides the successful design.

6.—The Editor cannot hold himself responsible for the return of unsuccessful designs.

VOL. IV.—No. 22. APRIL-MAY, 1895. PRICE EIGHTPENCE.

ISSUED EVERY OTHER MONTH, ABOUT THE END OF SEPTEMBER, NOVEMBER, JANUARY, MARCH, MAY, AND JULY.
SIX NUMBERS FOR 4/- YEARLY.
Foreign Subscription (post free) 5/- Yearly.

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London: 1 Imperial Buildings, Ludgate Circus, E.C.

CONTENTS.

INDEX TO MANUFACTURERS.

WITH NEXT ISSUE we propose to present a chromotype supplement produced by the

"Three-Colour Process."

This is at the request of many subscribers, and we anticipate that considerable interest will be aroused thereby.

An attractive chromo-lithographic **Portrait Supplement** is also in preparation for the next number.

OUR SUPPLEMENTS.

THE chromo-litho "**Bottle Label**" forms an attractive suggestion for similar classes of work. The design admirably lends itself to the purposes of effective advertisement, being striking and withal tasteful. Messrs. Manders' inks are used throughout, seven workings being included in the specimen. The effect of these inks is wonderfully clear and brilliant, shewing that they are particularly well adapted to the purpose.

The "Madder Lakes" Supplement again shews a series of inks tending to increase the already high reputation of Messrs. A. B. Fleming & Co., Ltd. These inks are prepared with a view to giving permanency, transparency, strength, and easy working, and experience shews that they fulfil all they claim to do.

Messrs. Fleming draw attention to the list of inks and prices included at foot of this supplement. They will be glad to send samples and quotations for other inks and new shades on application.

The Arms Supplement continues the series of armorial designs intended for the use of artists and draughtsmen.

The Bronze Supplement affords a practical example of what may be produced by the bronze powders manufactured by Messrs. Eiermann and Tabor. The use of gold is an everyday occurrence in most printing offices, and, it might be added, the dissatisfaction at the eventual appearance of bronzed work is oftentimes part of the daily programme. This need not be the case, for bronze powders may be obtained from this well-known house to gratify the tastes of the most critical. The reputation gained by Messrs. Eiermann and Tabor is of no mushroom growth, their productions being used by very many of the best firms in the printing trade, so that all lithographers requiring bronzes to work satisfactorily, and to wear brightly and clearly, would do well to place an order. We recommend the supplement to close attention.

The "Ink Photo" Process Supplement is an example of the effects obtained by Messrs. Sprague and Co., 4 and 5 East Harding-street, Fetter-lane, E.C., in working this attractive process. As referred to in last issue, this process is a half-tone litho method of reproduction, by which the closest detail may be obtained. The effect closely resembles collotype in some respects, the grain being so like a soft graduated stipple as to produce half-tone with much success. The supplement in question was reproduced from a silver print. Messrs. Sprague will be pleased to furnish information concerning the utilisation of their process.

Answers to Correspondents.

"J.W.B." (Newcastle) asks for information in reference to the working of designs and coloured pictures upon china. We may say that this process is confined to pottery works, and the methods of procedure are not by any means familiar to the trade. The common ware is decorated with symmetrical patterns, which are transferred by a rub-down process from copper-plate transfers, pulled in the necessary pigment to withstand the stoving. As to the better class of chromo subjects, it is possible to prepare them entirely upon a faced paper, which will allow of the subsequent transferrence of the picture from the paper to the china by a damping and rub-down process. This resembles the ordinary coloured "transfers" which can be obtained in sheets and transferred to any object. Such transfers or decalcomanie prints must be printed in the opposite order of printing to lithographs, so that when transferred they will have the first printing uppermost. These pictures must be most carefully prepared, and printed in such pigments as will stand the stoving afterwards, but they cannot be expected to have the first-rate appearance of direct drawings and paintings upon china. Photographs can be transferred in a similar way.

"ANXIOUS ENQUIRER" asks us what to do with a zinc plate, and the only information he has respecting its manufacture is that it has been subjected to the sandblast for some purpose. In reply, he may quite expect that we cannot be of much use to him. The firm that sold the plate should at least have left the directions for use, or should have left some inkling as to whose manufacture it is. The sandblast is used to grain the patent plates, and we should think that it is one of the Hull zinc plates which is in hand. "Enquirer" should certainly obtain the necessary information and a few samples to experiment with, for zinc-plate printing is seldom acquired by experience on one or even half-a-dozen plates.

"The American Annual of Photography" for the ninth year is now before us, and is an ever-refreshing volume. There are over two hundred illustrations within its covers, thirty of which are full-page plates. Of the latter, there are two collotype plates—one from the Albertype Co., N.Y.; the other, called a steam press gelatine print, by the F. Gutekunst Co., Philadelphia—both of which are equal in every way to anything previously exhibited. There is one photogravure plate by E. C. Meinecke & Co., N.Y., which has lost some of its middle tone and detail in the figure, otherwise it is a fine print. There is a photograph on Ilo paper, one of the loveliest productions ever put on paper. It is useless to describe the print, for all description would fall short of its merits. There is also a plate by the Photochrome Engraving Co.—a process block printed upon a tint, the tint being omitted here and there to enhance the effect. For excellence and diversity of plates, for general get-up, and for the interest excited in all its pages, there is probably no similar annual in the world. There seems to be no expense spared in the effort to surpass all other publications. The book has some 250 pages of reading matter, and amongst its most useful articles will be found:—"Chromo Printing by Heliogravure," "Colour Screens for Composite Heliochromy," "Colour Screens for Use with Isochromatic Plates and Films," "Photography and Laws as to Copyright," "What is a Naturalistic Photograph?" as well as a mass of interesting reading and illustration. In the latter will be found kinetoscope pictures, microphotographs, telephotographs, and photography from a balloon.

IT is announced that Mr. William J. Linton, the famous wood engraver and poet, will shortly publish a volume of "Recollections." Although not so well known to the present-day engraver as to the previous generation, Mr. Linton stands amongst the first of British wood engravers, and many are the works which were embellished by his engravings. Messrs. Lawrence & Bullen are to be the publishers.

Mr. Henry Blackburn's Studio.

AMONGST the specialists who train students to keep pace with the times in all matters connected with illustration, Mr. Henry Blackburn's name is widely known, and at his studio in Victoria-street many of our foremost illustrators have learned to adapt themselves to the new processes. The late Randolph Caldecott, Mr. Lancelot Speed, and many names appearing daily on the pages of books and illustrated sheets, might be quoted. Mr. Henry Blackburn's studio was founded in 1890, for the purpose of following up the instruction received at South Kensington, the Slade, and other art schools, and turning the knowledge there gained to practical account. The system at 123 Victoria-street is to familiarise every student from the first with the requirements and limitations of the new processes, so that those who have had a good groundwork of education in ordinary art schools should not waste their time afterwards in adapting themselves to the new methods. Mr. Blackburn's speciality is to interest the student in the various styles and methods of drawing for the press, and so to develop and test his powers and *adaptability* for the work of illustration. "Some artists," according to Mr. Blackburn, "are fitted by temperament for drawing in line, some for wash work," and some for other processes, which we cannot enumerate here.

As regards "line work"—for which there is the greatest demand, on account of the cheapness and certainty of reproduction, and the greater facilities for printing—Mr. Blackburn's experience is that "no one artist can teach drawing in line without a tendency to mannerism, and that (as regards 'black and white') much of the general teaching in classes at art schools has to be unlearned, in order to get a good touch, and to draw with style, force, and originality." It should be mentioned here that the "*materials*" with which the students have to work are treated as of much less importance at the outset than a thorough comprehension of the principles of illustration, composition in black and white, etc. In this system of personal instruction in illustration, Mr. Blackburn's studio may be said to stand half-way between the ordinary art school and purely technical teaching, and therein may be the secret of the success of his students.

The first thing required of the student, after mastering the principles of illustration, is to notice the results of different drawings when reproduced; to see and handle the blocks as they come, untouched by any engraver's hand, ready for the press; *to see them printed;* and thus, step by step, to become familiar with the requirements of the processes. Some hundreds of "black and white" drawings also—originals and copies of good pictures, with their reproductions—help the student to form his style, and aid him at every step.

Mr. Blackburn's pupils are not allowed to "scribble," nor to do any hasty work. "There is no reason," he says, "why, in drawing for the processes, a man's coat should he made to look like straw, or the background of an illustration have the appearance of fireworks." Sketching from nature, or from the studio model, in pen and ink, which leads to so many hasty and ill-considered strokes, is discouraged, and a sounder and more deliberate method of drawing in line is inculcated from the first.

In "The Art of Illustration," Mr. Blackburn says, that "everything worth doing is worth doing well; and on the assumption that the processes in common use are worth all the care and artistic knowledge which can be bestowed upon them, we would press, upon young artists especially, the importance of study and experiment in this direction. As there is no question that 'the handwork of the artist' can be seen more clearly through photo-mechanical engraving than through wood engraving, it behoves him to do his best. And as we are substituting process blocks for wood engraving in every direction, *so we should take over some of the patience and care which were formerly given to line engraving.*"

This is the gist of the matter, and the basis of the teaching at Victoria-street. One has only to turn to the latest number of *Harper's Magazine* to see what importance is attached to the artistic treatment of "line work" by the processes—"line work," be it understood, which will print at the type press.

In wash work, now so largely used in popular illustrations, Mr. Blackburn frankly acknowledges the assistance of the schools in accustoming students to make monochrome studies from life; "but the proficiency we see," he says, "in the American magazines will never be reached through the medium of art classes alone, every one of the experts in the pages referred to having had special and individual teaching."

Amongst the peculiar features of Mr. Blackburn's studio should be mentioned *the study of failures.* In the course of the twenty years he has devoted to this subject, thousands of drawings have been put through the processes, the majority of which (such as those sent annually for the *Academy Notes*) being ill adapted for reproduction. "These 'failures,'" Mr. Blackburn says, "have proved the most instructive and helpful of teachers as to what to alter or to amend." In short, the system of teaching is as much "what not to do" as what to do. The results, good and bad, when explained to the students, teach above all things the scope and limitations of the common processes, printed on common paper and at great speed—the conditions under which most of the illustrations of the day are produced in England. Mr. Blackburn's students work almost daily. Wednesday is "Visitors' Day."—*The Artist.*

Do You Understand Colour?

OUTSIDE the boundaries of the art world there is a lamentable want of appreciativeness of the importance and significance of colour. Nature's lessons poured out with reckless profusion at every bank, where grow clusters of primroses like pale jewels in green settings, are eternally unheeded by women especially, who will adorn themselves with half a dozen different colours without the slightest regard to harmony or congruity. There is a fitness in colour which is something more than the result of mere accident or association. From the days of Solomon, the rich and splendid Tyrian purple has been associated with kings and thrones; and one of his stipulations in sending to Hiram, King of Tyre, for a workman to help in building the Temple was that he "must be skilled in purple." Amongst all Caucasian nations, and with the Romans, purple has ever been the symbol of royalty, and it is difficult to conceive of any more regal colour, although modern nations can only imagine the beauty of a colour that they have never beheld. The scarlet of the robes worn by the cardinals of the Romish Church is supposed to typify their willingness to shed their blood for the sake of Christ; whilst white has in all countries remained the emblem of innocence and purity, which is the origin of the wearing of ermine by our judges. In China white is the hue chosen for the mourning of the dead, yellow being worn on the same occasion by the Egyptians, whilst blue or violet is donned by the Turk when death occurs. In every country in Europe, except England, violet is the sign of mourning employed by the court, and obtains a much more artistic, if less sombre, effect than black, which is the least pictorial of colours from the point of view of decorativeness. In addition to colours symbolical of death, rejoicing, and other events, there is in almost every country a favourite colour. In China, yellow is the most beloved hue, whether or no because it most nearly resembles the national complexion is uncertain; whilst amongst savages red has the highest æsthetic value. The early Italian painters seem to have had a special partiality for a particularly lovely and soft shade of blue, which admirably harmonises with the sweetness and maternal tenderness of their Madonnas. Blue, perhaps, of all colours is the most universally becoming, though this is contrary to the ordinary popular theory. A more careful study of the effect of colour on the face, taken in conjunction with the hair and eyes and complexion, would lead to much more agreeable and harmonious results than are now apparent, when ladies of the most diverse complexions will array themselves in any colour that happens to be the fashion. Recently there was a passion for the beautiful, but very trying, colour called "magenta." Now the complementary colour of this shade of pink is a yellow-green, and the result was that women with pale sallow complexions became almost bilious, whilst even ordinary fair well-coloured faces looked yellowish. Again, lilac, purple, and mauve, beautiful as they are in themselves, should rarely be worn immediately against the skin, all the complementary green and yellow of the complexion being brought out in the strongest light.

Another attribute of colour nearly almost always unrecognised in dress is in its relation to size. The optical effect of white is to enlarge objects; that of black to diminish them. Consequently, for the big stout woman to array herself in white is as fatal to grace and elegance as it is a mistake for a thin Liliputian woman to dress in black. If it were not economically impossible in a city of smoke and dirt for the inhabitants to clothe themselves in white, both in summer and winter, it would be worth the serious attention of sanitarians to try and bring about so desirable and hygienic a change. It is a well-known scientific fact that dark colours absorb heat and part with it much more rapidly than light ones, a truth that we are constantly proving in domestic matters; for if hot water be poured into two vessels, the one white and the other black, the water in the latter will cool before the other. So, likewise, if two persons, one dressed in black and the other in white—all other conditions being the same—were to go from the cold external air into a heated room, the one in black would feel the heat sooner than the other, and on leaving the room would feel the cold sooner. A white garment, therefore, by preventing the external heat or cold from too suddenly reaching the body, and by preventing the body from too suddenly parting with its heat, is not only cooler in the summer, but, the material being the same, also warmer in winter, and as it keeps the body in a more equable temperature, is a great preventive to cold catching. Persons exposed to great extremes of cold would feel the severity far less if they were clothed in white woollen garments, which, like the white snow covering the earth in winter, prevents the radiation of the internal heat from passing out of the body. The popular prejudice as to the danger of white dresses in winter probably owes its origin to the material that is generally selected.—*Evening Standard.*

For Prices of Inks see Mander Brothers' List.
sent Gratis on Application.

Colour Printing

AS IT WAS—IS—AND WILL BE.

LITHOGRAPHERS in general and artists in particular are closely concerned with the developments of colour printing, and the following trenchant remarks by *The Artist* will be read with interest:—

"Before entering on our task we may be permitted to say that, in spite of the frequent reference to the 'myriad' processes of printing, we know of only four: firstly, intaglio printing, a term which to artists needs of no explanation; secondly, relief or letterpress printing—a system which embraces every variation from Gutenberg, Caxton, and Dürer, to the latest triumphs of the rotary colour printing machine; including English, Continental, and Japanese wood-cutting, European and American photo-engraving methods; thirdly, lithographic printing; fourthly, collotype, a beautiful process which, under many names, embodies the principle of printing from a gelatine film. It is true that the Woodburytype process does not properly fall into any of these classes, although it is closely allied with the last of the four. It has never been claimed for it, so far as we are aware, that it was in any way adapted for colour printing.

"Our object in formulating this classification is to clear the ground of matters of kindred interest, such as M. Lippman's fascinating 'Photography in Natural Colours,' or Mr. Ives's beautifully scientific lantern slides; the one is, to the lay mind, very abstruse and somewhat unconvincing; the other is eminently practicable, and suitable for revelation even to scientific babes.

"In dealing with the past it is evident of course that its only interest in this connection is its influence upon the present state of colour printing; we will therefore briefly sketch the history, so far as it concerns us, of this art during the times that it has been a recognised and important industry. Possibly antiquarians will discover specimens of colour printing in the tombs of the Pharaohs, or the invading Jap will unearth early samples of wood-block impressions from the archives of the Ming dynasty—when he gets to Pekin; nevertheless we shall at the same time be right in stating that colour printing, in England at any rate, was first done creditably from wood blocks. Fifty years ago wood engraving was a very profitable business, and later received a great impulse at the time of the great exhibition. Manufacturers' catalogues were then firmly established as a trade necessity, and colour printers were called upon to supply show cards and bills, of more or less artistic value. There was a process very much in use then, called Baxter work, which was remarkable for its combination of the intaglio and letterpress methods. The key was cut on copper, and the colours printed from wood and metal plates. The *Illustrated London News* published supplements prepared by this process, and its users drew into their net a very large catch of what is called commercial work. Lithography, which had been introduced from Germany, was, in the early days of engineering enterprise, ousting the more ancient methods of engraving on copper, and in the form of engraving on stone was, and is now, one of the most perfect systems of reproducing maps and diagrams. This process of printing attained the most wide popularity, as it was found that colour work could be more easily produced than by wood engraving, and at one time artists of repute would draw in chalk upon stone for the purpose of book illustrations, scientific and commercial work. Colour printing, therefore, on a large scale, depended mainly upon the Baxter process and lithography, the latter eventually triumphing as the more practicable and cheaper method. Wood engraving has been used at all times as a means of colour printing, but it never established itself so firmly as lithography. It never can be said that wood engraving was in possession of the field, which we can say of lithography twenty years ago. Those who remember—and there are not many who can forget—Randolph Caldecott's story-books, will recollect that they were all engraved on wood, and it is for that class of work that wood engraving has catered, though less and less, until it is almost extinguished by the mechanical processes of reproduction.

"Colour printing from process blocks has a very short history, if indeed the record of its progress can be dignified by that name. Within the last ten or twelve years this method has, however, grown to decent proportions, the first work of the kind coming from Parisian houses. Collotype in colours is of still more recent growth.

"We are now come down to the present day, and we cannot do better than to briefly review the position of the processes whose history we have sketched. Baxter work is dead; wood engraving has been dying by slow degrees; lithography is still used more than the other process for commercial and artistic work, but is seriously threatened by process; colour printing from chromotype blocks grows day by day in quantity and excellence, and we can safely predict for it a great future.

"These changes, having come about, seem to require some explanation, and we need not do more than to consider the respective advantages and disadvantages of the several systems. Wood engraving has succumbed because it was too expensive, too slow, and not always good. Even now, *Modern Art,* a beautifully produced German work, published in the English language, could not possibly be made to pay in this country unless the producer relied upon the Continental circulation for its chief support. The registration of the colour blocks is not always assured, owing to occasional shrinkage in the wood, and another disadvantage is that the originals cannot or ought not to be used in the machine, and are replaced by electrotypes. Our readers are, of course, sufficiently acquainted with wood engraving to know what constitutes its charm, and we need scarcely say that no other process can substitute that beauty of line which is to be produced only by the hand of the master. Briefly then, the reason of its decay is that printing from wood engraved blocks possesses no commercial value when compared with rival processes. Very different is the case with lithography, and it is not so easy to sum up in a few words the reason why this popular system is destined to be outdone by newer favourites. Some authorities blame the workman, some the employer, some point to foreign competition, and others to our dull, leaden sky. For ourselves we assign the general retrogression in the art to several causes. Firstly, the hand which used to wield the chalk upon a grained stone was, as a rule, the hand of an artist—now it is that of a 'litho artist'; secondly, grained stones are, except for posters, almost abandoned, giving way to the stippler and 'Day's Mediums'; thirdly, apprenticeship to the trade has been neglected, and technical education is an almost unknown thing. Deeper down than this is a truth which must be recognised, that there is no serious attempt made to cultivate artistic taste in those employed in any branch of this art.

"The deterioration in lithographic work must not, however, be placed entirely at the door of the draughtsman. There are certain causes over which he may have no control, and certain unsatisfactory conditions into which the art has been driven by the operation of economic laws. Keen competition has forced many men to produce inferior work. The demand for cheapness has to be met, and at the present time the rivalry between this country and Germany is proverbial. A writer asserts that many economic errors have been committed by the lithographic trade, amongst which he cites the admission of the Science and Art Department's pupils into the artists' room. This appears to us to be a rather exaggerated grievance. A more reasonable explanation of the ease with which the foreigner competes against us is supplied in an interview with an expert who says that the English colour printer does not possess the same facilities as his rival in the matter of light, space, and time. This is the short-sightedness of the employer. 'Haste' can certainly be read on nine-tenths of the lithography presented to the public at Christmas time.

"There are many Dutch colour-printing houses overflowing with orders for the English market, and it cannot be doubted that this cruel competition has seriously affected the fine quality of British work. Upon the matter of wages, too, there is a good deal to be said; our consul at La Hague recently reported that the printer's average earning per hour is fourpence halfpenny.

"In passing at once to the next subject, we should be doing lithography an injustice if we did not refer to the improvement in posters. Of recent years the advance in this department is marked and satisfactory. We hope that poster printers will take a leaf out of America's book; for it cannot be denied that many of the finest pictures exhibited gratis to the public, hail from the land of stars and stripes.

"To sum up the present position of lithography would be to say that the outlook is rather depressing; and although we candidly confess that we think the art has fallen on evil days—as art and commerce—we do not in any way mean to suggest that good work cannot be done. This question resolves itself into a commercial one which commercial men must settle.

"Nearly every important change from the use of one method to another has been brought about by the introduction of machinery permitting greater possibilities than before. The copperplate key in the Baxter process required the use of damp paper and a copperplate press. It was found that a transfer could be taken from the intaglio engraving and laid down to stone in duplicate or triplicate. Greater speed of production was the result. The invention of the Wharfedale machine placed letterpress printing at an advantage over its competitors, while the lithographic machine, introduced a few years later, performed the same office for lithography. This has been going on for many years, improvements in the one system being answered by improvements in the other.

"At the present time, however, the Wharfedale machine runs at a speed of about 200 revolutions per hour greater than the lithographic machine, and, in the production of large orders, firms very often undergo the expense of biting zinc plates

from designs already on stone, with the compensating advantage of output.

"The *Graphic* is the only paper that has for a long course of years adopted letterpress means in the publication of their beautiful coloured supplements. The proprietors have been enabled to insert coloured cuts in the type portion of the paper, and by the employment of process plates have produced most of their colour work on letterpress machines at their own offices.

"Rotary colour printing, too, is impossible for lithographic machines, and it is in this direction that the chromotype processes now in use will achieve an immeasurable advantage over their rivals of the stone and chalk.

"Chromo-lithographers and others bound up in colour printing interest should therefore look in the direction of process plates as a means of retaining in this country the orders which fly in such clouds to the Continent. This brings us to the last subject which our space will allow us to touch upon. 'Chromotypography' is an ugly word, covering a good deal, and, perhaps, before we divide it into two classes, we had better increase its length to 'Photochromotypography.' We will speak first of the strictly photographic principle; next, of the mixed method.

"The initial researches which have made the three-colour process possible, were carried on in that land of science, Germany, and did space admit, we should like to give a brief account of the growth of the process. We must be content, however, to say that in this process three photographs are made from the object, and in each the sensitive plate is of such a nature as to absorb one set of rays—say, for instance, the red. Before reaching the sensitive plate the yellow and blue rays are cut off by a coloured glass, which absorbs them. A wonderfully constructed apparatus called the photochromoscope has lately been invented by Mr. Ives, and it is the function of this instrument to divide the rays and make three negatives by a simultaneous exposure. In theory the idea seems perfect, and so far as it is applied to lantern slides or coloured transparency it is quite successful. To make a block of a colour sensation in half-tone is another matter, for immediately white is intermingled with the colour (this must necessarily be so, for different grades of colour are expressed by dots and lines), the true value of the colour sensation is lost.

"It is a mistake to argue that the sun's light being composed of three primary colours, that a very mundane substance like printers' ink is subject to the same laws. The colours of the spectrum united produce white light; pigments closely imitating them produce black.

"The strictly photographic method has not, up to the present time, produced for letterpress printing anything more artistic or satisfactory than other processes, and it has this disadvantage, that if there is the slightest inequality in the distribution of the ink, or any variation in the colour used, the whole picture is thrown out.

"We are not advocating the abandonment of researches into a sphere which, we believe, contains much that will be useful to colour printers and artists, but it seems to us that to be ultra-scientific in art is a mistake. A process that employs photography to do that which the hand of a skilled artist cannot do (except with the most elaborate care), and the hand to do what science has not achieved, is a compromise between two extremes."

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MR. JOSEPH PENNELL lectured at Toynbee Hall, on Feb. 16 last, upon the "Art of Book Illustrating." The lecturer's remarks were illustrated by lantern slides, which shewed pictures drawn by ancient and modern illustrators of the Press, both grave and gay, including Dürer, Bewick, Blake, Meissonier, John Leech, Charles Keen, Du Maurier, Walter Crane, and Phil May; and it was interesting to notice that the good works of the Old Masters could be magnified without any loss of their beauty, so carefully had they been finished. An amusing story was told of an artist who drew a field of daisies with a man looking through a fence. The engraver, for some reason, objected to the flowers, and without consulting the designer brushed them out and made a rushing river. The poor artist could say nothing. Mr. Pennell traced the history of the art of illustrating from the time of the cave dwellers. The Japanese were foremost as regards wood engraving. Of black and white illustrations, the lecturer said that public opinion regarded Leech as superior to Keen, but his candid opinion was that the productions of the latter were superior to those of the famous John Leech. Referring to the art of to-day, the lecturer criticised the work of the present living artists, and complimented the modern school highly upon their work. Black and white artists were undoubtedly worthy of their hire. They were the real artists of the age and of the people. As an instance of the wonderful progress made in the preparation of illustrations, Mr. Pennell drew a comparison between the old style of taking off a copy at a time very slowly, and Burne-Jones's picture of "Labour" being printed in the *Daily Chronicle* at the rate of over 20,000 an hour.

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Furniture and Decoration continues its career as the energetic exponent of the furniture trade. It overflows with information useful to the trade, and invariably contains a copious number of artistic illustrations—designs for all manner of decorative, useful, and art furniture. Our artist friends will much appreciate these designs and the frequent studies in art work.

India Ink.

AFTER many unsuccessful efforts to worm the secret of the manufacture of India ink out of the Chinese, science is finally to have the last say upon the product of the Celestial Empire. Gunpowder, porcelain, crackle china, green indigo, and, in fact, all the very ancient Chinese products, have been unveiled to us by science only, and it is science again that is to teach us how the Chinese manufacture their celebrated ink. The following is a brief *résumé* of the interesting researches, crowned with success, that have recently been made upon this subject:—

It has always been thought up to the present that the Chinese manufacture their ink by grinding a special lampblack, unknown to Europeans, with a suitable mucilage discovered by them, and that the paste obtained is allowed to dry slowly like their porcelain. The light that has just been thrown upon this subject is due to the progress that has been made in micrographic studies in recent years. In fact, upon submitting a very dilute solution of the most celebrated India ink to an examination by a very powerful microscope, it has been discovered that the particles of carbon forming the basis of the ink are of a uniform diameter.

Upon repeating such examination with inferior or counterfeit India inks, it is observed that the particles of carbon are of very variable and sometimes even disproportionate diameters. Upon submitting to such control all the numerous varieties of lampblacks, it is found that none possesses this regularity of the atoms. The blacks that most closely approach it are those that have been comminuted during the manufacture and the lightest portions selected. Nevertheless, the diameters of these are still more irregular than in India ink.

This first point established, a second remained to be fixed. Is the mucilage employed by the Chinese simple or compound? Thanks to the principle established by C. Koechlin and mentioned by Mr. Schutzemberger in his "Traité des Matières Colorantes," we know that two mucilages of opposite nature reciprocally thin one another upon being mixed, and, in proceeding by elimination, after analysis we find that the compound mucilage employed by the Chinese unites in itself about the extremest thinness of the Koechlin principle.

An India ink having been prepared according to these data, in a state of solution, and left at rest for one or more months and then decanted, it was observed that the particles of carbon more and more closely resembled those of the genuine India ink. Upon afterwards allowing this liquid ink to concentrate and evaporate in a vacuum, there is finally obtained a plastic substance which, when dried, has all the characteristics of the best India ink.

It was of interest, from a theoretical standpoint, to ascertain this latter fact; but in ordinary practice it seems to be much simpler and more rational to leave the ink in a liquid state, than to form it into a stick that it would be necessary later on to redissolve with some trouble. This liquid ink has the same properties as the best quality of India ink in sticks, and serves for the same purposes, such as making drawings and washes.—*Le Génie Civil.*

Modern French Illustrators.

THE past quarter of a century has been very fruitful from the view point of books of art and de luxe. An equal value has not been attained in the struggle to get books on the market first, a struggle which has resulted in overproduction. High-priced productions can in many cases be bought at greatly reduced values, and they deserve that fate. With them are many, really beautiful, which will remain, and deserve to. The abundance has been great—at times excessive.

Book illustrating during the same quarter has made vast strides, and any collection of this branch of art shews praiseworthy and interesting efforts. The schools of illustrators are notably brilliant, particularly the French group. Laurens, Adan, Rochegrosse, Merson, Le Blant, Conturier, Sergent, Lynch, Vidal, etc., are only a few of those who have acquired fame in France at illustrating. In the recent Paris book exposition these artists, and a hundred others, were well represented by the publishers for whom they work. Vignette work of the highest charm, taste, and distinction was represented, as was also the French school of wood engravers—those satisfied to reproduce the ideas of others, proofs of whose work, taken by Wittmann, the famous printer of copperplates, were also shewn, much to the satisfaction of the artists and lovers of this kind of work. In the instances where the originals were on view along with the reproductions, the spectator could fully appreciate the degree of perfection at which typographic processes for reproducing in colours or in black have arrived.

There is a great possibility, however, that the French illustrator will be gradually dispensed with through photography. Charles Mendel, the publisher, has been photographing from groups the past two years, and has met with what may be called success. Models representing the characters of a story are selected and clothed in the requisite costumes. They are then photographed, with the necessary scenery—cathedral, cloister, or castle. The photographer poses the characters and combines the groups. The proofs are heliograved and then sent to the printer. The illustration of that book is thus due directly to photography. There are difficulties to be surmounted, and this method is not always successful.—*American Bookmaker.*

SPECIMEN OF SPRAGUE & CO.'S "INK PHOTO" PROCESS

THE FISHERMAN'S HAVEN: HOPE, SOUTH DEVON.

Reproduced, by permission, from a silver print supplied by an Amateur Photographer.

Inconsistencies of Illustration.

THE suitability or otherwise of book and magazine illustrations of the present day forms a subject upon which many authors not only think strongly, but express themselves very forcibly. The *Writer,* a Boston contemporary of much interest, has pretty well threshed out the subject, and some of the views of its contributors may well be placed before our artist readers.

One author feelingly says that it is all very well to have your story or article embellished by illustrations; the pictures make it more attractive, and the young author feels a pride that his thought should be more fully transmitted to the admiring public by means of the illustrator's art; yet there are times when in an agony the suffering author would cry, "*Don't;* oh, don't."

It is bad enough when the creature you have made the embodiment of all charms and graces, a maiden fair and slender, appears in a gown the style of which dates some two years back, and with a physique that is anything but "willowy."

This is a trifle light as air, however, compared with the atrocious cruelty of depicting a youthful hero first in short trousers, then in long and very whole ones, and later in knee breeches, and very ragged ones at that. Think of the feelings of that boy at being put back!

Yet such a cruel thing as this has actually been done. In extenuation, let it be said that while it was the same boy, he appeared in three separate stories, and possibly each was placed in the hands of a different illustrator. Yet consistency in his apparel is something which should have been seen to. The same editor accepted the three stories, and they followed each other quite closely. In the first the boy was very small, a newsboy, in short trousers. In the second he had been promoted to office boy; he had grown considerably, in fact was quite unrecognisable, but this might have been attributed to his rise in life. But in the third story, alas! he was again a ragged youngster in knickerbockers.

The general reader may have passed these blunders by unnoticed, but to the author they were annoying. At best, one's conception can be but inadequately expressed by the illustrator. Cannot the author, then, in justice demand that his work be exempt from all attempts at illustration, if illustration invites these glaring inconsistencies?

A second correspondent writes that he possesses an illustrated edition of "The Raven," in which the artist has depicted Poe with outstretched arms and *clenched* hands, imploring the raven to tell him if there is "balm in Gilead."

"Tell me, tell me, I implore."

The illustration speaks command. One never pleads or implores with clenched hands (except in pictures) if he expects to receive either a tangible object or an immediate answer to a heart-felt prayer. The hands may be clasped—not clenched—when anguish predominates, but even in this condition the arms would not be outstretched. The very nature of things forbids an objective gesture with a subjective thought.

In making pictures for the old and yet favourite song, "Comin' Thro' the Rye," the illustrator frequently falls far short of representing the idea of the author when he pictures the lassie coming through a field of rye. In this case the very beauty and delicacy of the song is lost, for there is nothing to cause a "lassie" to be "shy" when coming through a field of rye, or wheat, or oats, or any other grain; but there is cause when the barefooted lassie, with carefully adjusted dress and skirts, "meets a laddie" while she is tip-toeing her way on the stepping-stones across the swiftly-flowing Rye burn.

In an illustrated edition of Shakespeare's "Seven Ages of Man," issued by a Philadelphia house of publishers, the artist has illustrated each character according to his conception, but not always consistently with the text.

"Then the soldier,
Full of strange oaths, and bearded like the pard."

The artist has evidently not sufficiently noticed the pard, or he would never have indulged his hero in full whiskers or a beard.

It has been a matter of surprise that great artists in painting angels have always represented them as women, and that in painting devils they have always represented them as men. Whilst it may be natural for woman to be angelical, it does not quite follow that men are naturally devilish.

Very many other glaring inconsistencies might be instanced, but sufficient has been said to justify the authors' complaint.

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The Detroit Free Press suggested the other week that photography should be used to illustrate stories throughout, and says that "all a journal would need to do this is a photographic studio and a few models to pose as the characters in the stories." Quite so; but many book illustrations are inadequate enough already without the efforts of the inartistic photographer. The men who can pose and effect really good composite studies, or pose subjects appropriately for book illustration, are, we venture to say, few and far between.

Stained Glass:

A CRAFTSMAN'S POINT OF VIEW.

THE harmonious and effective arrangement of stained glass for window architecture is a fine art in itself, and a fascinating study even to artists whose work may be more closely allied to other branches of industry. Thus the recent lecture by Mr. Lewis T. Day, at the Royal Institution, on "Stained-glass Windows from the Craftsman's Point of View," besides possessing much information of an historical nature, will doubtless interest many of our readers.

Mr. Day informed his hearers that there is no certainty that stained-glass windows were in vogue in Europe much earlier than the twelfth century. Coloured glass is one of the oldest of decorative productions, but it is not probable that the craft of stained-glass window-making was prevalent in Europe before the twelfth century.

The Venetian glass makers were the earliest in Europe. They probably got their methods and secrets from Rome, whither they had travelled from Greece, and the Greeks must originally have received their inspiration from ancient Egypt. From Venice, the use of the coloured glass spread to France, where are still to be found the earliest specimens of its use in ecclesiastical windows. Still these windows were rarities even in the twelfth century; not until Church windows expanded in size, and commenced to be glazed throughout (in the following century), were many of them seen. Mr. Day impressed upon his audience from the outset the great technical and structural differences between the early coloured glass windows of the twelfth and thirteenth centuries and those of the Renaissance period. In both periods the two terms, "stained glass" and "painted glass," were applicable. But in the first case, painting was only used to help out the stained glass; whereas, in the latter period, stained glass was used only to help out painting. Stained glass proper was glass to which in the melting-pot certain metallic oxides had been added, so that the whole mass was stained right throughout its substance. This was technically called "pot metal," to distinguish it from the glass used in the later history of the craft, which was only surface-coloured. In the latter case, sheets of colourless glass were painted upon with certain substances, which, when the glass was afterwards "fired," formed a transparent vitreous enamel of different colours, according to the staining material used. But with the surface-colouring methods the early "stained glass" craftsman had little to do. For him a "stained glass" window was practically a mosaic, built up of pieces of different coloured "pot metal." The early craftsman was not a painter nor even a designer in the present sense of the word; he was a glazier, and his skill was exercised in putting together various shaped pieces of coloured glass, something like a Chinese puzzle.

Mr. Day caused to be thrown on the screen a map of Italy, and proceeded to explain how the mediæval craftsman would go to work to build up a window, using the map as his design. He would mark out the design boldly with charcoal on a large board; then he would take sheets of coloured glass, and laying them over the design, cut out pieces of his glass to fit the outlines, each area on the map being cut out of a different colour. The work was difficult, and irregular lines had to be avoided as much as possible, since the use of the diamond for cutting was unknown. The workman traced the outlines with a red-hot iron, and trusted to the glass afterwards, following these lines when it was fractured. The irregular edges were trimmed up with a "grossing iron." These pieces of glass were confined solely to giving local colours. The main outlines of the design were furnished by the lead with which they were joined together. For more detailed lines the craftsman had to paint with a substance, which, when afterwards "fired," stained the glass a dark brown. Other details were obtained by using this brown stain to stop out the light from passing through the coloured glass in such a way that the undarkened portions formed a design, the painted portions merging in the dark background. But in all this it was important to remember that in the earlier "stained glass" windows this method of painting on the glass was never used for giving colour; it was strictly reserved for outline and shading. Painting in colours did not come in until the sixteenth century. Thus, in the ancient windows, a face would be made out of a pinkish glass, cut to the outline of the face, on which the lines would be brown. Trees would be of green glass, outlined in the same fashion. This method was, therefore, a case not of painting on, but of working in glass, and much resembled the methods for producing cloisonné.

The lecturer advanced reasons for the belief that the first suggestion of coloured glass windows came from a desire to imitate enamel work with the aid of translucent material. A series of interesting examples of early windows was thrown on the screen—largely from Cologne, Bourges, and Canterbury cathedrals—and the gradual progress in elaboration and artistic treatment traced. Mr. Day pointed out that colour, not form, was the essential feature of these early windows, and upon the former quality their beauty depended. The figures belonging to this period were rude, crude and grotesque. To take them as figure designs one must be an archæologist; they were not so much saints and martyrs as bogies, ugly enough in some cases to frighten timid children.

Mr. Day's subsequent lectures on "Arts and Crafts" subjects are to treat of the later history of stained glass in ecclesiastical architecture.

German Collotype Printers.

(Continued from No. 21.)

SCHWERIN.

BÄRENSPRUNG'S HOFBUCHDRUCKEREI, established in 1699, ranks among the leading houses in Germany for the excellence of its work. Its collotype department turns out mat and glazed reproductions of every kind, the negatives being carefully retouched. The firm works chiefly on its own account, but does not refuse orders. The main branch of the business is the printing office, with seven steam presses; in addition to which there are departments for lithography and photo-lithography in the widest sense of the term, zinc etching and autotype. The staff consists at present of about eighty persons, so that the firm is in a position to execute promptly and properly work which requires the simultaneous application of a number of reproductive processes.

Eastern Germany seems to offer no very favourable soil for collotype.

BRESLAU,

however, is an exception, where C. T. Wiskott (1806)—in addition to photography, etching, chromo-lithography, and printing—possesses a very efficient collotype branch, in which every class of work is done, principally for the art and industrial art publications of the firm. Among these we we may mention: "Come to Me," by H. Hoffman; "Our Army," by Röchling; "Sketches of Plants," by Stauffacher; "From the Portfolios of German Masters." The Erste schles. Lichtdruck und graph. Kunst-Anstalt A. Fabian & Comp., Breslau (1886), employs twenty assistants, four steam and two hand presses, and possesses a branch for photo-lithography and zinc etching, in which catalogues, illustrated works, posters, and letter headings and souvenir albums are turned out.

Besides the collotype houses of Dresden and Leipzig already mentioned, the kingdom of Saxony possesses a number of collotype firms which are not devoid of importance. The Erste Oberlausitzer Lichtdruck und Photographische Kunst-Anstalt Johannes Beyer,

ZITTAU,

was established ten years ago, and gives employment to thirty persons, working six steam and one hand presses. Its principal productions are mat and glazed collotypes, the latter chiefly as imitation photographs for portraits and landscapes. Having its own printing office and bindery, the house undertakes the production of entire catalogues and works, and exports to England, Spain, Portugal, Austria, Belgium, and Russia.

Anders & Schwiebus, of

LÖBAU,

who started a year ago, devote themselves to price lists, views, portraits, etc. Paul Knäbchen, of

ZÖBLITZ

(1878), has fifteen workmen, one steam and eight hand presses. His work is in pattern sheets for technical undertakings, art plates for class journals, architectural pictures and views. Edmund Müller, of

CHEMNITZ

(1885), is a collotype and lithographic printer with a staff of ten workmen and a steam collotype press. A notable speciality of this house is high-class printing on textile fabrics. M. Fickenwirth, of

ZWICKAU

(1867), has a small establishment with two hand presses chiefly used for technical and industrial art work. Paul Köhler, of

MARIENTHAL,

near Zwickau (1884), has five assistants and four hand presses, and mostly turns out glazed collotypes. Carl Becker, of

NAUMBURG

(1883), employs ten workmen and three hand presses. His specialty is post cards, greeting cards, souvenir albums, portfolios, and views. The firm does work to order and also publishes on its own account. It has lately issued a very pretty album of the celebrated Schulpforta. Joh. Reinecke, of

MAGDEBURG,

prints albums of views, post cards and letter paper with views. George Behrens, of

BRUNSWICK

(1871), does black and coloured collotype, and has published some 860 views of Brunswick and reproductions from Brunswick collections.

Georg Alpers, jun., of

HANOVER

(1884), undertakes photography, collotype, and

photo-lithography, particularly reproductions of architecture and views. W. Hiehold & Son, of

CLAUSTHAL

(1883), working with fifteen workmen, four steam and four hand presses, supply pattern sheets and books for industrial purposes, especially for art ironfounders, reproductions of designs, etc. The firm also undertakes printing and lithography. L. Bruno Blücher Nachf., of

ALTENBURG

(1880), has three assistants and two hand presses, and prints diplomas, views, plates for price lists, etc. C. am Ende, of GERA

(1880), is occupied in letterpress and lithographic printing, collotype, zincography, autotypy, photo-lithography, employing eighteen persons, two steam and three hand presses. The collotype department is chiefly occupied with work for books, price lists, pattern sheets, posters, and similar work. The firm publishes architectural works and albums of views. Schlick & Schmidt, of

SAALFELD

(1877), mainly print illustrated catalogues, and export to Austria and Hungary.

Dietz' Hofbuchdruckerei, of

COBURG,

dates from 1589, has a staff of fifty-six persons, and a very efficient department for collotype and coloured collotype with four machines. The house is further equipped for letterpress, litho, and zinc printing, binding, and so on, so that it is in a position to undertake orders of any extent. It does export trade to England, Russia, Scandinavia, the Netherlands, Belgium, Switzerland, and South America.

The collotype printing and publishing house of Junghanns & Koritzer, of

MEININGEN,

which also does lithographic and letterpress printing, is chiefly devoted to albums and views, post cards with views, works of art, and pattern books. Jaeger & Co., of DORTMUND

(1883), work with eight hands, two steam and three hand presses, all their work being done to order. The firm also executes work in phototype and photo-lithography, and has an export trade to England. In ISERLOHN

the principal representative of the branch is the letterpress, lithographic, and collotype printing house of F. W. Jung (1857), which has a staff of thirty to forty persons, with three collotype presses, four litho and four letterpress machines, together with a number of auxiliaries. The collotype department is chiefly devoted to industrial purposes. Dr. Lange & Hoffman, of

ELBERFELD

(1891), have eight employees and one press, and furnish pattern books, diplomas, prints, and other collotype work and zinc etchings. They also export to England, America, France, Belgium, etc. Wilh. Otto, of DÜSSELDORF,

photographer and collotype printer (1859), prints with twenty assistants and three presses all kinds of collotype work for art and trade, and exports to various countries. The photographic studio is lighted by electricity. B. Kühlen, of

M.-GLADBACH

(1825), has one of the best equipped offices in Germany, with a total staff of 150 persons; five machines are at work for collotype, twelve for chromo-lithography, and others for photo-lithography and letterpress printing. The collotype department is chiefly active in reproducing pictures, drawings, works of art, etc., illustrations of catalogues, price lists, editions de luxe, and the like. The firm publishes a large number of religious pictures and books, such as the "Sceptra Mortis," Lives of the Virgin, etc., and exports considerably to European countries, America, and Australia. Th. Creifelds, of COLOGNE

(1852), works in collotype, photography, and photo-lithography, with six assistants and one press. Pet. Honnefeller, of

AACHEN

(1882), executes collotypes, heliogravures, photo-lithographs, lithographs, and autographic prints, with seven hands and six hand presses. In the same town is the house of C. H. Georgi (1883), with five assistants and four hand presses, working in works of art, industrial articles, and so on. The house does its own photo-lithographing, lithographing, and collotyping. Kipper & Hildebrandt, of KREUZNACH,

have, in addition to their stationery factory and wholesale business, a collotype department working with six persons and four hand presses.

[*To be continued.*]

ON the much discussed subject of foreign competition, the *Stationers' and Printers' Annual* says: "*Apropos* of colour printing in its bearing on stationery, and in this particular in reference to Christmas cards, we may mention a striking experiment which was made by a leading London house dealing in this line of goods. An advertisement was inserted in a number of papers inviting terms and specimens of work from English printers for chromo-lithographed Christmas cards, the house in question having been accused of favouring the foreign colour printer. In response to this advertisement only some dozen replies were received, and the specimens of work submitted were found to be so immeasurably inferior to that supplied by the Continental makers, that the London firm felt it had vindicated its action in the past, and had no resource but to send to the Continent for its work in the future, or until such time as the colour printer in this country could produce results equal to his foreign *confrères*."

MANUFACTURERS OF
BRONZEPOWDER, BROCADE AND
LEAFMETAL.

Eiermann & Tabor

Embossed with our Bronzepowder
substituting Leafmetal.

LONDON E.C.
7. Woodstreet Square 7.

HIGHEST AWARD CHICAGO 1893 ✣ GOLD MEDAL ANTWERP 1894.

BY CHARLES HARRAP.

CHAPTER XIX.

TRANSFERRING "PLATE-RULINGS," ETC.

An important part of the transferrer's work is to put down transfers of steel and copper-plate rulings, stipplings, and grains. It is not always that the stone is sent freshly gummed out from the artist, but not infrequently the stone has to be cleaned up for the ruling to be put down, or there may be so many ways of using the rulings, that the first transfers of rulings have to be rolled up, previous to putting down a second and third series of rulings to produce deeper shades. It is most interesting to see what a large amount of effect can be obtained by the judicious use of grains, stipples and rulings in colour, as well as black work. It has been shewn by the "Tennyson Supplement" in THE BRITISH LITHOGRAPHER, Vol. II., No. 12, that even a high-class chromo can be worked out mechanically by the skilled use of Day's Medium, and by E. T. D. Stevens' advertisement in the same journal, Vol. IV., No. 21, that the same Medium can be most effectually employed for monochrome. In a similar way, such firms who have not the Day's Medium, but have a good set of ruled, grained, and stippled plates, can use them advantageously to lessen the laborious and monotonous task of stippling up by hand the large surfaces of half and quarter tint in colour stones, by transferring the various kinds of mechanical grains. The extensive use of rulings, etc., requires care in transferring, so that nothing is lost in the cost by any one stone being spoiled. Therefore, the transferring demands special notice, and although no hard and fast line can be laid, yet in the majority of cases the following method will be found successful.

With the stone previously polished and subsequently gummed out, the method of procedure is straightforward. If the stone is to receive a number of patches of rulings, then every patch must be previously cut, the direction of the lines marked on the back, and the patches and stone numbered, so that in putting them down every one fits without any mistake in the angle of the ruling. In having to put a number of patches down upon a gummed stone, it is impossible to damp the stone. Therefore recourse must be had to using a warm stone and damp transfers. The amount of moisture in each patch must be so small that it is not advisable to put on more than two patches before running through to get them fastened, and damping them to retain the adherence. After each pair has been thus fastened and damped, another pair should be added; the whole lot being put down rapidly, or the last transfers will be found to be too wet. A stone prepared in this way will be ready to go through the ordinary course of a stone having received damp transfers, the treatment for which has already been fully dealt with in previous chapters.

But when a stone has been under gum, the case is more difficult. The gum must be washed out before there is a possibility of the ruling getting a firm hold upon the stone. Where possible, after a thorough soaking in several renewals of clean cold water, followed by two or three good washings with boiling water, the stone should be slightly polished. But where polishing is out of the question, then chemical means must be taken to remove the gum. It always seems to be a question of preparing the stone, irrespective of the real necessity to remove the gum. To effectually remove the gum is to prepare the stone. Chemicals which simply gloss over the gum, and assist the ink to catch on the stone, are of little value practically. There are many instances when a wash with acetic acid or alum solution will assist the ink to catch, and ultimately the ink gets through to the stone and obtains a fair hold, but this is uncertain and unsafe. The most advisable course is to soak the stone well with several supplies of the cleanest, softest water. Follow this up with soaking the stone well with soft clean boiling water, and dry it before an open fire. To wash it once with cold and once with warm water is a failure. The stone can be effectually cleaned with sufficient hot water. In case there should be any doubt as to the cleanness of the stone, the washing with water should be followed by a very weak solution of nitric acid—not acetic acid or alum. The nitric acid decomposes the gum and forms two or more other acids with it, which are removable with hot water. The point is to keep the acid solution weak. Citric acid has a very similar effect, but is not so positive in its action as nitric acid. Acetic acid has been shewn in previous chapters to cause the formation of a film upon the stone, instead of actually cleansing the stone, and many are the disasters which follow its exclusive use. Sufficient has been said to shew how a stone may be prepared for ruling transfers. It only requires that the stone be thoroughly washed with hot water and dried before a fierce fire to remove all moisture, before the necessary

matter can be gummed out to receive the rulings. Rubbing and rolling up should be proceeded with cautiously, and the judicious use of Lithophile or its substitutes will materially assist the soundness of the transfers. In many instances, after one set of transfers has been put down, some of them—or all of them—may be removed, and the stone may be gummed up where necessary to allow of a second set of transfers being crossed over the first. This all depends upon the care which has been exercised in keeping the gum undissolved upon the stone during the first transferring.

If alum be used, except in the very weakest solutions, it is certain to cause the lines of the ruling transfer to spread nearly double their real thickness. If acetic acid be used, it is very probable that portions of the lines will wash or roll away afterwards.

On the question of ruling transfers, it is most important that they are pulled in a good firm waxy transfer ink. Such an ink will give excellent full transfers, and will not be so liable to thicken by the chemical action of the acids used, or by the pressure used in transferring. Such an ink does not require "baring" or "pulling through" before use, as it is sufficiently firm and thin in itself. If the transfers are pulled in a "soft plate ink," then it may be found necessary to pull them through. If pulled through, it should be done under a fine blanket and with a light pressure, otherwise it will result in the lines spreading to a small extent. In pulling a plate transfer the paper sinks into the engraved lines, and on the face of the transfer the work and paper stand in relief. By running such a transfer through the press, the "relief" is flattened, and the ink which was on the sides of the relief lines must be forced outwards by the ink and paper forming the summit of the relief lines.

The age of a plate transfer does not materially affect its quality. If anything, an older transfer goes down finer than a new one. So long as the plate transfer ink is a good one, and the composition on the paper contains a good gelatine, the transfer should, if kept covered up in a drawer or other closed place, be in good condition for a month or two, and probably more.

In dealing with the method of putting down patches of ruling, it is not absolutely necessary that they should be put down singly upon the stone. If an impression can be taken from the drawing before it is gummed up, then the patches can be all made up upon this impression, and all put down at once. This method is quite practicable, and has been frequently employed, because a drawing in litho ink will yield a very fair impression before it is rolled up. Again, if a key stone exists, then the ruling can be patched up on an impression from it, and transferred at one operation to any colour stone gummed out for the purpose.

In all cases of transferring ruling, where so much depends upon the clearness and sharpness of the result, it is imperative that no sheet of backing paper shall be used to face the stone a second time, unless turned over to its other clean side. The apparent waste of a number of sheets of paper during the process of putting down a lot of patches is not in reality a waste but a necessity of the process. During the transferring operation when a lot of patches are being put down, the backing must be kept fairly soft with a number of sheets of paper, or a fine, firm blanket; otherwise the constant repetition of the running through tends to smash the lines of the ruling.

Closely allied to these processes of cleaning a stone to receive ruling, is the method of cleaning an old stone to receive new transfers or drawings. In this latter case, much depends upon the time the stone has been under gum, where it has been stored, and whether it is grained or polished. In any case the gum is removed by the same means. But if the stone has been stored in a damp place, then it must be kept in a gradual heat for some hours or days to thoroughly dry before any attempt is made to clean. After such treatment the gum is removed as already described, and when clean, those parts which have to receive new work should be wet or dry polished. If that be impossible, then a careful treatment with weak nitric or citric acid must follow to clean the gum out. This is especially applicable to grained stones, where it is impossible to regrain the surface. With polished stones another process may effectually be used.

In the latter part of chapter XVII. a process is mentioned for polishing away the work, and bringing it back again by careful treatment. The same process is applicable to old stones when new work has to be added. The whole stone, or only parts of it, may be polished down slightly, then rolled up, and the surface thus polished again prepared in the ordinary way for receiving ruling.

CHAPTER XX.

TRANSFERRING CHALK DRAWINGS.

In chapter XVI. the general question of transferring is dealt with in almost all its details. Chalk or grained paper is mentioned, and with it the methods of retaining good register, even though the paper has to be damped and placed upon a warm stone. The gradual revolution in the trade, which has almost supplanted warm stone transferring by cold stone transferring in every instance, has also been brought to bear upon chalk or grained paper drawings. It has been the custom of the trade to draw with the litho chalk upon cold grained stone, but it is always necessary to chemically change the character of the chalk when thus used by an "etch" before it is rolled up Since chalk has always been drawn upon cold stone, it is equally admissible to transfer the same

chalk from grained paper to cold stone. The chalk paper is thick and requires a lot of moistening to remove it from the composition after the transfer is put down. The damping must cease, however, to be so liberally applied after the thick paper is once removed.

In transferring a chalk transfer to a cold stone, the stone must be damped rather more than for ordinary paper, because the composition will readily absorb the moisture, become dry, and leave the stone. Considerable judgment must be used, for too much damping will dissolve the chalk ; but as soon as the composition has been once fairly moistened, and has adhered to the stone, its gummy nature will protect the stone from taking chalk there afterwards. The paper should be kept adherent to the stone, and this necessitates damping from the back frequently and constant running through. The paper should be removed from the composition as soon as possible, so that the composition may receive a moderate supply of moisture and the running through discontinued. When that position is attained, the transfer, with the composition still intact, should be left for half an hour or more to allow the chalk to get a good hold in the stone. When the composition is finally washed off, it is just as necessary to etch it with a weak solution of nitric acid or strong solution of tea in gum, as it is to etch a newly made drawing upon grained stone before rolling up. If this is omitted, then the drawing is certain to be thicker than was intended by the draughtsman. The knowledge of this has in the past been met by the draughtsman always keeping the work on grained paper a shade lighter than intended in the finished print.

The method of etching is performed by making the weak solution of nitric acid in gum, and brushing it evenly over the drawing, allowing it to dry on. Then the stone is washed with water, and very sparely rolled up in a medium ink. A few impressions should then be taken, with a light pressure to remove all surplus chalk. In the course of half a dozen impressions all the chalk will be removed, and the ink will be rolled upon the grease in the stone. At this stage the stone may be washed out with turps and oil, and finally prepared for proving, as already described in chapter XVII.

In transferring chalk drawings to stone, there is no reason why the stone should not be finely grained. Such a grain would materially assist the solids and heavier tints, and could not do any harm to the lighter shades. The grain would also assist the rolling up, and ultimately yield an impression in which the mechanical character of the grained paper would be partially removed.

[To be continued.]

Art Poster Designing.

THE Poster Exhibition at the Royal Aquarium afforded an opportunity of seeing the work of the great French poster artist, M. Jules Chéret. He has recently told an interviewer that he regards the colouring of an advertisement as all-important, and that he works almost entirely with red, blue, and yellow, though by overlapping colours further effects are gained, as with the work of other artists. M. Chéret does not consider posters in black and white good for advertising purposes, and when asked to define an ideal poster says that it should be as simple as possible, and the introduction of at least one figure—almost invariably a lady—is indispensable, and whenever it is possible the figure should be life-size. The Chéret posters are never smaller than 60 centimetres (two feet) by 86 (nearly three feet), the favourite size being 250 by 90. The figure should be elegant and brightly dressed in some striking costume not likely to go out of fashion as long as the poster is to be in use. M. Chéret always makes a point of designing the lettering of the actual advertisement, and has no faith in black and white letters; but as producing the effect of black without giving a jarring tone, he has no objection to very dark blue, red, or violet. He expects clients to leave him absolute freedom in the subject and treatment of the design.

IT is significant to learn that with its March, 1895, issue *Paper and Press* absorbs the *Lithographers' Journal*, that journal now ceasing to have an independent existence. While the already popular *Paper and Press* may thus be benefited by the addition of a new department, yet one not unnaturally comes to the conclusion that lithographers apparently did not support their trade organ as it most undoubtedly merited. Is it to be inferred that lithographers in the States are less sensible of the teaching value of a trade journal than their letterpress brethren? The prosperous appearance of the *Inland Printer, Paper and Press,* and half-a-dozen other American journals devoted to typography and stationery—not to mention those catering exclusively to pressmen—surely indicates the probability of such a conclusion being founded on fact. It does seem to us that the suspension of a trade journal, or even the merging into another publication, is a grave reproach to the trade or trades it is associated with. There is an increasing tendency to utilise a working combination of lithographic and typographic methods, and, maybe, this is leading to such a commingling of the processes that the litho artist, printer, and those otherwise concerned with methods appertaining to lithography are becoming content to sink their individuality, and merge into the wider growth of the typographic art. Is such a result immediately before us?

Litho Machine Management.

THE Prize Essay in a recent B.L. Competition on this subject was reproduced in last B.L., No. 21, and the following has been considered also suitable for publication :—

Before starting machine, oil all the working parts; see that the cam wheels work free, as they sometimes get clogged with oil and dirt, the wheels then wearing flat. If this be the case, clean them with paraffin oil, wipe dry, and oil the spindle. Should they still slip, apply a little powdered resin to the cam. Do not put oil on the cam.

Before putting stone in machine, see that the bed rises and lowers freely; it sometimes gets jammed through not being taken out and cleaned. The bed should be taken out occasionally, cleaned, and the bearings well greased. The bedding should consist of about a quire of thick paper covered over with a sheet of zinc or oil cloth, the stone being then put into a smooth bed. A spirit level should be placed upon it, the stone being levelled by placing thin strips of paper under the thin end. Should the machine be slightly out of level, the difference must be allowed for. The amount of pressure may be regulated by placing a straight edge across the stone, then raise or lower the stone on a level either with the cogs or the side plates, according to the make of the machine. Every machine should have a gripper mark at each side of the bed; then, by placing a straight edge across from mark to mark, the stone can be placed in the exact position, and should then be blocked in. If there be any difficulty in keeping the stone damp, take out the dampers, rub them well with a little turps and water, then scrape them, and try again. Should the difficulty be with one side only, examine the damper springs to see if they are not much tighter one side than the other. Should you fail to get a good impression, do not go piling on colour or pressure; maybe you used too much water in starting, the water having got into the inkers; clean up rollers, scrape dampers, and make a fresh start; well roll the ink into the inkers before allowing them to touch the stone.

Should you not be able to get a good impression one side of the machine, it may be that the cylinder spring on that particular side requires tightening, or it may be caused by the original spring being replaced by a badly tempered one. It is best to get these springs from the maker of the machine. If the pressure is by lever, and you find such a defect, take out the pressure bars, place them together, the lever holes exactly meeting, then see if the slot in one bar is the exact distance from lever hole as the other. One machine has been known to have a pair of pressure bars with the slots differing in their distance from the lever hole one-third of an inch, thereby making a considerable difference in the pressure on a long leverage. The closer the slot to the lever, the more solid is the pressure.

Should you find it necessary to have the stone higher one side than the other to get the work up properly, thus causing the cylinder to rise with a jerk, you will probably find that the rod connecting the cylinder with the pressure bar on that side is slightly longer than the other, making it necessary for the cylinder to rise some little distance before the lever can act. These defects should be at once remedied.

Should the job require to be fed with ink from the duct in one part only, viz., in the centre, or at one or both sides, do not make the common mistake of tightly screwing the end of knife, and trying to force open the centre, or *vice versâ*; such handling would soon spoil it. Leads should be cast to fit the duct, which would enable you to keep the ink in the position you wish to feed the ink from. The duct roller may be regulated by lengthening or shortening the arm.

Should the side lay not register properly, examine the screw which regulates the opening and closing of grippers; it may have got loose, thus causing the grippers to close too soon, viz., before the side lay has moved its proper distance; the sheet then gives at the side edge; or the gripper wheel having become worn flat in places, causes the gripper to close quicker one time than another, giving the same bad effect on the registering. There should be as little distance as possible between feeding board and gripper; the feeding board should be well screwed down before starting.

The cylinder brake wheel requires careful attention. The pressure of brake should be slightly altered when changing the speed of machine—too much brake is as bad as too little. Should the cylinder come home too sharp when you have a fair amount of brake on, apply a touch of powdered resin. If this fails, examine the leather on brake—it may have got worn at the end, where the leather should be slightly thicker.

Litho machines are in a measure like the machineman—they require cleaning, feeding, and doctoring; not repairing at the eleventh hour, but a stitch in time; not a pint of oil to-day and none for another month, but a little each day; not clean on the outside only, but the more vital parts within.

All nuts and bolts should be examined occasionally, for should they work loose without being noticed in time, much damage may be caused. The machine will work better, and last longer, if laid on a perfectly level and solid floor.—PATRIA.

BY laying the foundation stone of the St. Bride's Institute, the Prince of Wales shewed his interest in printers and their work, and now his Royal Highness has expressed his willingness to take the chair at the forthcoming Festival dinner of the Printers' Corporation Pension.

What is Colour?

CHAPTER XIV.—*continued.*

In further explanation of the luminosity of colours, the following table reveals the relative brilliance of coloured papers, such as those used for newspapers, periodicals, and posters. The table shews in the first place the colour of the paper; secondly, how much per cent. white is actually present in the colour sensation over and above the rudimentary colour of the pigment or dye stuff; and thirdly, the luminosity of the coloured paper as compared with white paper, taking the latter luminosity at 100 points.

Colour of paper.	Percentage of white light present with the pigmentary colour sensation.	Luminosity of the paper, white paper being taken as 100.
French ultramarine	61·0	4·4
Cobalt	55·5	14·5
Blue-green	42·5	14·8
Vermilion	2·5	14·8
Brown paper (dark)	67·0	19·5
Emerald-green	59·0	22·7
Brown paper (light)	50·0	25·0
Eosin dye (*Sporting Times*)	72·0	44·7
Orange	4·0	62·5
Chrome-yellow	26·0	77·7

These calculations given by Abney shew clearly which is the most effective colour of paper to use for a readily attractive wall poster. Experience has proved to the observer that amongst all the hybrid placards on the hoardings, there are none which catch the eye so readily as those with a good yellow background. In fact, yellow paper and black printing form at once a striking contrast and luminous arrangement for advertising.

CHAPTER XV.

THE NATURE OF PIGMENTS.

Having in the previous chapters enunciated all the details of the physical characters of colour, considered almost entirely as the decomposition of white light, it is now necessary to deal with the matter as it affects pigments. Useful references have been made to pigmentary colours, and in some subsequent chapters it will be requisite to return to further deductions affecting the numerical value of the colour reflected by pigments. Before treating upon the colour effects obtained from pigments, it is of signal importance to have a clear conception of what pigments really are. To give this information thoroughly would require more space than the subject deserves for the purposes of this treatise. Therefore the pigments will be dealt with briefly, so that the reader may gather a sufficiently sound idea of their manufacture and composition, to shew what materials have been used in the manufacture, how they have been used, and the ultimate composition of the pigment itself.

Pigments are derived from all the material sources of the crust of the earth, and from some mineral and vegetable organisms. The earths, or ochres, combined with metals are a fruitful source. Minerals, pure and simple, are seldom used; whilst metallic pigments are very common. Coal-tar is an abundant source of pigments, and may be considered as of vegetable origin. Some few other vegetables are used in the fresh state; and a few pigments are due to animal sources.

In round numbers there are manufactured, under a great variety of names, 26 yellow printing inks, 70 red inks, 30 blue, grey, and violet inks, 35 brown inks, 40 green inks, as well as some 5 or 6 white, and 7 or 8 black printing inks. These pigments having a diversity of chemical composition, require to be brought into such compounds only as will not cause great subsequent changes in the colour required. The pigments which are used for lithographic printing inks are those which will receive most attention. Some few oil colour pigments will be treated, because they are frequently used in the first-class lithographic establishments to obtain otherwise impossible hues. Each series of pigments will be now treated as freely as possible as a whole, and finally special remarks will be added for any of the series where necessary. As the yellow is the first printing, and is of so much importance to the after printings, it will be the first to be dealt with, all others following in sequence.

Chromes.—Prepared by treating metallic lead with strong alcohol vinegar, to obtain lead acetate. This process takes four hours or more. Potassium bichromate solution is formed with water, and ten to twelve times the amount of bichromate. To obtain the lead chromate, mix the two foregoing preparations. By mixing some lead bichromate or chromate with lead acetate solution, the coloured chromate is dark lemon. By mixing a caustic alkali in the filters to the lead acetate and potassium bichromate solutions, a red chromate is formed. The same lead chromates can be obtained in a very fine condition by mixing filtered solutions of acetate of lead and neutral chromate of potash. Lead chromate heated with saltpetre gives orange.

The chrome-yellows suffer by exposure to foul air, and it has been found that many of them turn brownish in course of long exposure to air. Being compounds of lead, they are chemically good driers, and in making them into inks driers should not be added. They are very opaque, and cannot be successfully used to make transparent tints. In use it is necessary to print them first, because of their opacity. In printing the chromes first, they give an enamel or surface to the paper which can be turned to good account in the after printings. Lead pigments should not be used in conjunction with the following pigments:—Indian yellow, yellow-lake, Italian pink, crimson, and other cochineal lakes, carmine or indigo, if it is necessary to retain the purity of the chrome-yellow. The chromic acid of these chrome-yellows reacts more or less on all other pigments, and tends to change their hues. In ordinary manufacture, chromes are freely adulterated with baryta (a compound of barium). Such adulterated chromes break with a rough cleavage, and shew specks of white or cells in the composition. Pure chromes break with a smooth surface, the pigment is dry, smooth to the touch, is soft, and easily broken. To make a dry chrome pigment into an ink, it is necessary to add 20 parts of varnish to every 100 parts of the pigment. It is a great mistake to "pass" a yellow printing as judged by gaslight, for it appears at least fifty per cent. paler than in daylight.

Chrome pigments are made up into some eleven different shades of lithographic inks, of which the following shews a comparative tabulation:—

TABLE OF CHROME PIGMENTS.

Winsor & Newton's, Manders', Richardson's, Lorilleux's, etc.	Berger & Wirth's (Leipzig).
Primrose-chrome or light yellow	chrome-yellow No. 1013
Lemon-chrome	,, No. 4
Pale or canary-chrome	,, No. 10 ,, No. 9 ,, No. 8 ,, No. 408
Middle or citron-chrome	,, No. 3
Deep chrome	,, No. 2
Orange-chrome or bright orange	,, No. 6
Red-chrome	,, No. 1 ,, No. 7

YELLOW-CHROMES.—Paler tints of yellow may be made by using flake white with the yellow-chromes. By adding to yellow-chrome pigments a very small amount of purple-lake and some white, the vividness is somewhat counteracted. It is omitting this precaution which frequently causes so many otherwise well-printed chromo-lithographs to have such a strong yellow and objectionable cast. The printing quality of this and other self-drying pigments is considerably improved by adding a small quantity of one of the pomades—Manders' or Trochard's—which assists in the absorption of the pigment by the paper, and if judiciously used prevents the possibility of the after printings drying glossy, as well as in assisting in the printing of any number of colours afterwards without them becoming mottled or refusing to dry in a reasonable time. Chrome-yellows should be ground in stiff varnish for fine work. For machine work, after grinding in stiff varnish, they may be reduced with thin varnish, or tempered with a pomade. As a rule, if ground in thin varnish they become lumpy, and clog in printing. All chrome-yellows are useful as a first printing on under-sized papers or enamels, as they constitute an enamel in themselves. They may be used in the preparation of gold bronzing inks, both as colouring matter and as driers.

From yellow-chromes the following mixtures may be made:—

ORANGE by mixing mid. or lemon-chrome and vermilion.
GOLD COLOUR by mixing mid. or lemon-chrome and carmine.
YELLOW-BROWN by mixing mid. chrome and Indian red.
LOW-TONED GREEN by mixing mid. chrome and black.
OPAQUE BRIGHT GREEN by mixing lemon-chrome and Chinese blue, or Antwerp blue.
BRILLIANT AND RICH GREEN by mixing mid. chrome and Prussian blue.

Although only one of these is called "opaque," it is nevertheless a fact that they are all opaque to a considerable extent, and, in printing, the same effects may be produced by overlaying the second colour by subsequent printing upon the chrome. The colour combinations are not restricted to the above selection. Numerous stone colours and buffs may be readily obtained by subsequent printings of pink and grey upon the chromes. Flesh colours of the coarser type may be similarly obtained, and almost every shade of colour may be made to owe some of its effect to the underlying yellow. Upon this point there is no more instructive process than the three-colour printing process, or photo-chromotype, to shew that by the judicious use of yellow, overlaid by red and blue, almost all the colours necessary in a good chromo-lithograph can be successfully produced.

[To be continued.]

The Centenary of Lithography.

THE celebration of the hundredth anniversary of the discovery hy Senefelder is interesting lithographers abroad much more than in this country. In France, the Society of Litho Artists has formed a committee charged with the organisation of an exhibition to fittingly celebrate the occasion. The committee already promises a most successful result. The exhibition will be held in the Rapp Gallery, Paris, and amongst other things will include—by specimens—a history of the art from its discovery to the present day, and work from the first presses and productions up to date. By a comparison with foreign lithography the progress and value of the French work is to be demonstrated, and finally it is intended that it shall form the nucleus of an exhibit for the proposed Paris exhibition.

Enterprise amongst Wood Engravers.

An interesting exhibit is being held in Stationers' Hall, London, by the International Society of Wood Engravers. A large number of exhibits are arranged on screens and along the walls of the fine old hall, and the work shewn is undoubtedly of high merit and much value. The competition of other methods of reproduction has increasingly forced wood engraving out of the market for many classes of illustration, the "age of rush" apparently demanding a decrease of time and cost involved in the methods which prevailed when wood engraving held its own, and this exhibition is being held with the object of somewhat reviving public interest in an art which is everywhere acknowledged as such. In former times there was but one way of producing an engraving on wood. It was drawn on the block by the artist or the engraver-artist, and then engraved by hand. The "process" methods dispense with the hand-tooling. At a first stage the drawing can be transferred to the block by photography—a method also utilised by wood engravers —but in the following processes the use of chemical methods is resorted almost wholly to.

Wood engravers naturally pin their faith to the older method, claiming that the results are more artistic and superior to those produced by the new "process," while advocates of "process" maintain that it renders or may be made to render the texture and quality of the original drawing with a fidelity beyond the reach of the graving tool, and that a good drawing can be reproduced in absolute facsimile with all the freedom of its brush work and the happy imperfections of line which exhibit the artist in his first, second, and third thoughts of inventive improvisation. On the other hand, wood engravers step by step contest these claims, asserting that the graver can be no less faithful in rendering impression and handling than in all else. "The proof of the pudding is in the eating," and the examples of modern work shewn in this collection are fully intended to maintain and prove the statement made by the wood engravers. In some of the examples the drawing has been made on the block by the artist, in others by photography, but in all the block has been afterwards cut by hand.

Amongst the accessory details of interest are some of the ancient and well-thumbed engraving tools by which Bewick achieved such fame. The great publishing houses have contributed largely to the splendid collection of modern engravings thus exhibited, and the *Graphic, Illustrated London News, Punch, Modern Art*, the *Pall Mall Gazette,* and Messrs. Cassell have been liberal contributors. The skill of Swain and his colleagues of the *Punch* staff is shewn in a fine set of *Punch* proofs after Tenniel, Du Maurier, and other artists. Some gems in pure line contributed to the *Century* are the work of the eminent American engraver, Mr. Cole, who, by the way, is English by birth.

Rightly considered one of the finest things in the collection is Donner's "Bacchus and Ariadne," after Titian. The glory of the original is its colour, and some of the mellowed splendours of its harmonies are rendered with surprising felicity, considering that the engraver had necessarily to confine himself to the medium of black and white. A larger and broader style is seen in the work of Roberts and of Babbage, whose heads of Cardinal Manning and Mr. Ruskin, respectively, are the perfection of that style. The head after Rembrandt, by Baude, is a masterpiece in foreign work. The exhibition has decidedly demonstrated that the wood engravers can and do produce most excellent work.

The Merchandise Marks Act.

ITS EVASIONS.

The quarterly meeting of the Hanley branch of the Amalgamated Society of Lithographic Printers was held on Friday evening, March 8th, at the Borough Hotel, the subject for discussion being "The Merchandise Marks Act." The following resolution was proposed by Mr. W. J. Rushton (branch president), seconded by Mr. C. Hardy, and passed unanimously:—"That in the opinion of this meeting the above Act is grossly and purposely evaded by the unscrupulous foreign trader by the employment of such foul and unfair methods as the use of fugitive inks in the printing of imprints, etc., the same fading completely away after the lapse of a short period, the lithographs, etc., then being sold broadcast to the public, there being nothing to shew that they were not printed in England. Also the employment of wrappers covering numerous copies of lithographists' and Christmas cards, the wrapper bearing the words 'printed in Germany' being removed and the goods sold without the public being able to judge where they were produced. Also books and publications, the printed matter done in Germany and sent away unbound, and therefore being passed into this country as unmanufactured, the binding being done in our own country, most probably by foreign labour, then passed off on the British public as British manufactured, the result being very unfair and unjust to the buyer and to the British industry generally, and likewise keeping thousands idle who would very probably be fully employed. We also strongly disapprove of 'foreign prison made goods' being imported into this country and sold to the detriment of the British trade. We are therefore determined to call the attention of Labour representatives and local members of Parliament to this evasion of 'The Merchandise Marks Act.'"

The Imperial Institute Lectures.

THE fifth and concluding lecture introductory of the forthcoming Special Exhibition of Photography was delivered at the Imperial Institute on March 18th last, by Mr. Lionel Clark, C.E. It was entitled "Photography as an Instantaneous Recorder." Professor W. Chandler Roberts-Austen, C.B., F.R.S., took the chair at the lecture, and at the "House" dinner which preceded it. After drawing attention to the impossibility of dealing with each branch of such a large subject within the short time at his disposal, the lecturer then defined the requirements of a perfect recorder, who must, he said, be able to take the indefinitely great and indefinitely little, for lengthy and short times. He dealt with the methods of producing instantaneous photographs—first by the well-known means of shutters, and secondly by illuminating the object to be photographed. Captain Abney's researches in regard to measurement of the speed of shutters was discussed. Where very rapid exposures of more than the 1-100th of a second were required, recourse was made to the electric spark, by means of which it was possible to give an exposure as small as the 1-200,000th of a second. The researches of Lord Raleigh on bursting soap bubbles were illustrated by photographs taken by the electric spark, and prepared as lantern slides. The bubbles had occupied about the 1-300th to 1-400th of a second in bursting. His experiments with jets and drops were discussed and illustrated. Photographs of Professor V. Boy's flying bullets, with an initial velocity of about 2,000 feet per second, were exhibited and criticised. Campbell Swinton's discharges on a photographic plate were referred to, and a slide shewing similar markings on the arm of a boy struck by lightning was thrown upon the screen. Amongst other slides shewn were several giving the records of lightning flashes, hail storms, various other meteorological phenomena, and clouds taken by polarised light, by Mr. Birt Acres. In dealing with the recording of high temperatures, the lecturer shewed slides illustrating Professor Roberts-Austen's experiment, and records made of the melting points of the most refractory metals. The very interesting method of obtaining the longitude by photographic means, due to Captain Hills, R.E., of the Royal Engineers' College, at Chatham, and photographic instruments for surveying, were next referred to. The result obtained by the tele-photographic lens of Dallmeyer, and numerous photographs taken from balloons and from kites were shewn; together with photographs of interesting crystals, a curious set of photographs taken in the spores of the bacillus of anthrax, by Marshall Ward, and peculiar effects of interference, by W. B. Croft. Photography as a means of identifying criminals was then considered. A fine series of military photographs shewing the explosion of land and submarine mines followed, special interest attaching to the last photograph of H.M.S. *Victoria* which was taken as the vessel was in the act of sinking. A miscellaneous series shewing photographs of animals, bee life, and illustrating the well-known paradox why the top of a wheel moves faster than the bottom, was terminated by examples of some of the earliest instantaneous photographs ever taken. A cordial vote of thanks to the lecturer, on the motion of the chairman, brought a most interesting lecture to a close.

Artists and "Process."

COMMENTING on Mr. Gleeson White's lecture before the Society of Arts on "Drawing for Process Reproduction," the *Publishers' Circular* takes up the artistic as opposed to the mechanical side of the question, and roundly advises artists to abandon any hostility to "process" they may have felt in the past. The writer says:

"There can be little doubt that artists are too often contemptuous regarding the mechanical side of art. Perhaps they will now recognise the errors of such a policy. The easier they make things for the engraver, the better will be the final presentation of their work. So that mechanical perfection will tell artistically as well as commercially. Again, artist, editor, and publisher might co-operate more closely than they have co-operated in the past. It is only by sympathetic co-operation that the best results can be obtained; and it is certain that to abuse 'process' is idle; for it is a product of the time, and, so far as can be judged at present, it has, in the American phrase, come to stay. We must make the best of it, and that best, in the opinion of competent authorities, is by no means contemptible."

AGAIN to the fore, the London *Daily Chronicle* has become the pioneer of illustrated journalism connected with our great dailies. During the latter portion of the County Council election campaign illustrations were included with each issue. These were from drawings in black and white, by such well-known artists as Alfred Parsons, Walter Crane, Joseph Pennell, Linley Sambourne, Phil May, and others. The series opened with a cartoon by Sir Edward Burne-Jones, representing "Labour"—Adam digging and Eve spinning.

THE ARTIST (jumping out of bed—"Hurrah! Hurroo! Bully! I've got it!"

His wife—"What's the matter?"

The artist—"I've had the nightmare!"

His wife—"Well, what of it?"

The artist—"What of it? Think of the suggestions it gave me for my next Art Poster!"

—*Chicago Record.*

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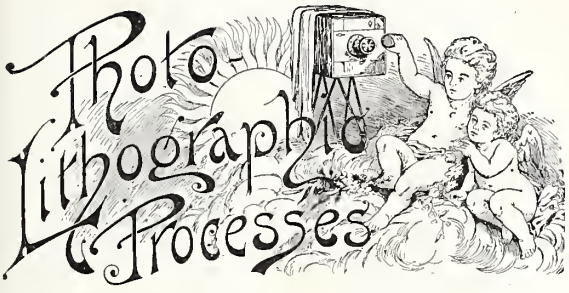


COLLOTYPE.

CHAPTER XXI.

COLLOTYPE PRINTING AND PRINTING MACHINES.

THE earliest collotype machines seem to have been made by Faber & Co., of Offenbach, but they were so complex and delicate that they were soon superseded by the stronger machines by Alauzet & Co., of Paris, Koch, of Leipzig, and Schmiers, Werner & Stein, of Leipzig. Still more recently, in fact in 1893, Furnival & Co., of Reddish, commenced the manufacture of collotype machines in England. These latter machines being constructed originally upon the Continental pattern, have been very greatly improved since the first was made, and can now be considered amongst the best collotype machines in the market.

The great difference between a lithographic machine and a collotype machine is that the latter has two sets of inking rollers and no dampers. The method of inking is the same in the machine as in the press. The ink must be put on heavily by leather or skin rollers, and finally cleared off and tinted by rolling over with the composition rollers. Damping, too, has to be effected as in the press. The collotype film is damped through with the glycerine solution, and this damping should not require renewing, when the plate has been worked into proper order, more than once in twenty-five impressions, or even more. The speed of printing is slower than for lithography, and if an average of 200 impressions per hour be obtained it will be as high as present machinery and the present methods of preparing the film will allow. But machine printing is better adapted to the preservation of the film than hand-press work. In the hand-press the impression is obtained by a scraping process, whilst in the machine the impression is obtained by the cylinder motion, which simply brings the paper in contact with the film, and does not drag the paper across, or in any other way give a dragging motion. Collotype films require steady inking, and the machines made by Furnival & Co. are adapted for single, double, and treble inking to meet this want. The damping must be done occasionally, as required, with the machine at rest, for the damping liquid must lie on the film for four or five minutes to soak well in, then be dried off with a sponge and dabbed free from moisture.

The covering of the cylinder should be of india-rubber, packed underneath exactly with a piece of smooth thick paper, which is cut a shade smaller than the picture or design on the film, so that this packing gives the necessary pressure upon the picture and avoids extra pressure being put on by the edges of the mask, which are liable to cut the film. This packing may be varied by the use of cards, thin paper, and blotting paper, to suit any circumstances. The mask is somewhat awkward to manage. There may be an adjustable masking arrangement made of slips of brass, or a mask may be fed in on each sheet. For the latter purposes there will require to be some half-dozen masks, so that one can pass through and another be fed in whilst the one last fed is returned to the feeder.

The printing process requires the best care which a lithographic printer can exercise. The plate may be damped for a quarter of an hour whilst the ink is being worked upon the rollers. Each set of rollers is arranged to work upon its own inking table, and at the same time by automatic levers prevented from rolling on the film. The ink first put on should be stiff, and not until it is found to be too stiff should it be thinned. When the film is properly damped, it is advisable to use a little liquor ammonia in the damping solution to go over the heavy shades, whilst a little salt in another portion of the damping solution is very useful to give crispness to the lighter parts. A good damping solution may be made of

Glycerine	300 parts.
Water	100 ,,
Liquor ammonia	10 to 20 parts.

During printing a steady temperature should be maintained, and in order that printing may be started at short notice there should be gas heating arrangements under the machine, which will keep the film from getting too cold, and assist in ready and rapid printing. In starting to print, the pressure should first be adjusted, and the character of the impressions should not be paid too much attention to until the pressure is correct. Then the film should be washed out and damped, and printing actually started. If the ink on the leather rollers is too thin, it will be picked up by the composition rollers, and carried to the thin-ink table. This will necessitate washing up and a new start. Whilst stiff ink is supplied to the leather rollers, a mere varnish tinted with the ink will suffice for the composition rollers. All kinds of devices are resorted to for the production of successful prints. A skilful machine-minder may soak some parts more than others, or treat some parts with salt and not others. He may give a double impression when the picture is very thin and extra rolling has not proved effective. If the prints are scummy,

then the film must be well soaked with the damping solution until the scum does not print. In the matter of damping, much depends upon the paper used. A hard imitation hand-made paper has been known to print for 800 impressions without damping; whilst an extreme case has been known of 1,500 impressions being taken without damping. Soft papers, however, absorb the moisture and necessitate damping at least once after fifty impressions.

In collotype printing machinery great care should be paid to having the inking rollers worked automatically, so that they are brought gently up and brought as gently down upon the film as possible, to prevent the gradual knocking of the film to pieces by the jolting of the rollers upon the edges.

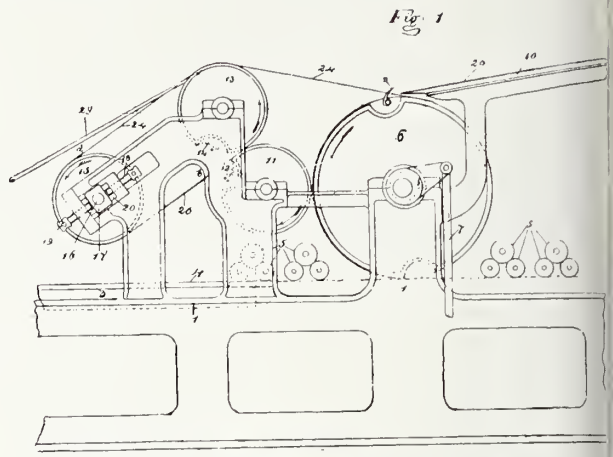
The film plates are adjusted in the machine as already described for the hand-press with metal clips or blocks running in diagonally set grooves, so that any size of plate can be fitted in a large machine. Under the plate is frequently placed a sheet of white paper; and to avoid much concussion slips of cork or leather should be placed between the metal blocks and the edges of the glass.

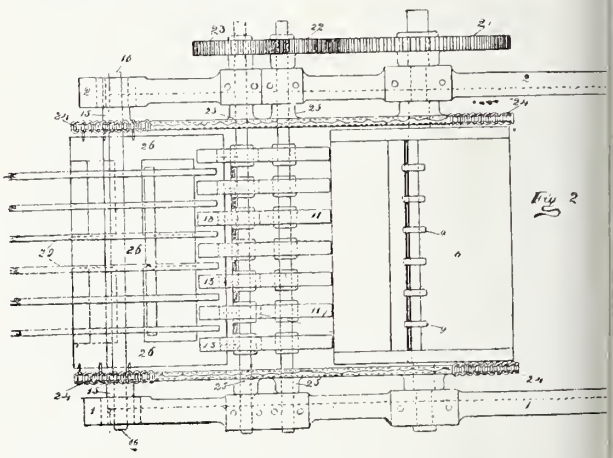
The machine-minder will find that he can pay a very much larger amount of attention to the printing in collotype than in lithography, for damping is reduced to a minimum, and the composition rollers require so little attention, leaving only the leather rollers to be kept under control. The duct has not yet been found of much service, as the ink is so stiff and small in quantity that it can be successfully fed from the riders.

In damping the film, some printers use water only, but that is seldom so successful as glycerine and water. Common salt is added when the air is very dry. In damp weather the film may become so moist that it requires to be taken from the machine and dried by heat. A hard over-exposed film is difficult to damp, whilst an under-exposed film takes moisture readily enough—sometimes too readily.

The accompanying outline figures—as shewn in an early number of the B.L.—serve to illustrate the principle and the mechanism directly connected with the automatic frisket, without any attention being given to the other parts of the machine, with which most printers can readily make themselves familiar by inspecting any letterpress machine.

Figure I. shews, in side elevation, the feed-board, 10; the impression cylinder, 6; the transfer cylinder, 11, which is half the diameter of the cylinder 6; the delivery cylinder, 13. These cylinders, 11 and 13, can be replaced by a series of pulleys. Both cylinders are of the same diameter. These three cylinders carry sets of grippers at 9, 12, and 14, which serve to take the sheet from one to the other after printing, and bring it to the fly, 29, for delivery. Cylinder 6 drives cylinders 11 and 13 by the toothed gearing shewn at 21, 22, and 23, fig. II. The movable bed is shewn at 3, and the printing plate at 4, the various positions



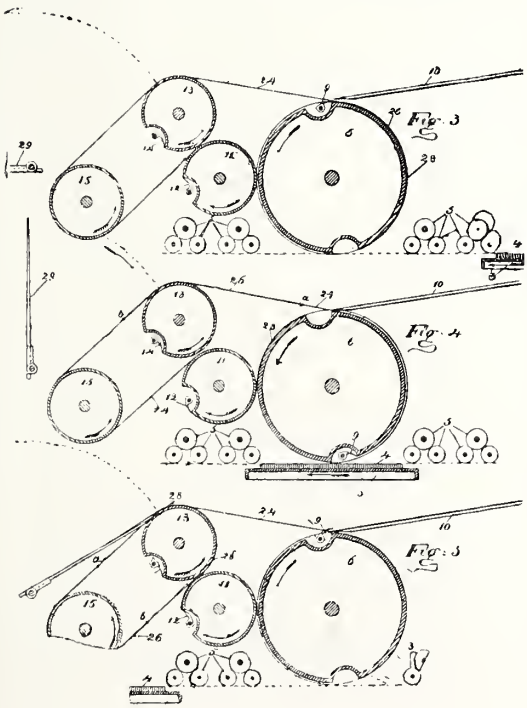


of which during printing are fully shewn in figs. III., IV., and V.

The parts thus mentioned indicate only the automatic delivery, and it remains to shew the frisket mechanism. The cylinders 6, 11, and 13 are provided at the sides of the machine—as shewn in plan in fig. II., at 24, 25, and 25—with the necessary toothed (or sprocketted) edges, to carry endless chain gear. This chain gear is also carried forward around a special chain gear wheel at each side of the machine, as shewn at 15. This wheel can be adjusted so that the tension of the chain is always correct. The frisket, which is not a very large affair—and varying with the size of sheet printed—is held across the machine by the chains at each side, and when in motion is constantly being carried under the cylinder 6, over the top of the machine, and back again. This motion is best understood by following the positions as shewn in the illustrations, figs. I., III., IV., and V. In fig. I., the frisket, 26, lies around the wheel 15, from the small letter *a* to the letter *b*; when set in

motion, grippers 9 take the sheet, and advance with it towards the under surface of cylinder 6 to meet the plate, 4, just as in a lithographic machine. But as the sheet advances, so does the frisket; and when grippers 9 reach the cylinder 11, the end of frisket 26*b* has reached the same point, and the sheet with the frisket over it travels under the cylinder, comes in contact with the printing plate, and passes up the other side, as shewn at 26 and 28 (being the printed sheet), fig. III. On arriving at the gripping position under the feed-board again, the frisket is at 26, as shewn from *a* to *b* in fig. IV. The grippers 9 do not release the sheet, but carry it forward to cylinder 11, whose grippers, 12, next take the sheet; cylinder 11 carries the sheet to the grippers, 14, of cylinder 13, which carries it forward to the fly delivery, 29. By this time the cylinder 6 has completed its second revolution and is ready for a new sheet from the feed-board, and all the other mechanism has assumed the position as shewn in fig. V., ready to go through the same course of operations.

The arrangement displays considerable ingenuity and must meet with great success, notwithstanding some disadvantages which it possesses. It is argued that the printer must be able to see and get at the printing surface, and this mechanism certainly prevents it. The substitution of pulleys for the cylinders 11 and 13 will allow of a lot of light being thrown upon the subject, but the frame-work of the machine is necessarily so high on each side to carry the shafts, that it is quite impossible to get inside to the printing plate. It is not customary to attend to the printing surface on the inking side of the cylinder, but it is an advantage which is made considerable use of by most printers.



[To be continued.]

Engraved "Half-Tones"

ARE arousing some interest amongst wood engravers and process men. A recent issue of *The Century Magazine* contains a picture of "Bonaparte Pawning His Watch," by Eric Pape, who represents a school of art in black and white which is becoming very popular on the other side of the Atlantic. The method employed is intended to meet the acknowledged shortcomings of all process work. A half-tone plate is worked over by the wood engraver, and where the mechanical process has failed to reproduce the effect of the original, the engraver either supplements or replaces the defects. The method is all the more interesting as it restores to wood engravers an importance which they have been in danger of losing, and does something, at least, to keep alive an art which was distinctly in decline. Mr. Timothy Cole, who occupies the first place among American wood engravers, has done much to arouse an interest in the art by his masterly reproductions of pictures by the Old Masters, and the thanks of the public are due to the proprietors of *The Century* for making these masterpicces known. The cost of first-class wood engraving compared to mechanical reproduction is very great, but the engraved "half-tone" as thus instanced represents a happy medium of cost, and certainly gives a higher artistic finish to the work.

ALL interested in Western Australia are informed that a map shewing the Murchison, Yilgarn, Coolgardie, East Coolgardie, and Dundas gold fields is now nearly ready for issue. The map has been compiled from the Government maps, and measures 27 × 25-in., and shews the situations of all the newly formed mining camps. The map will be mounted on canvas, and can be obtained either to fold up in book form or mounted on rollers, and the price will be 2/- post free, unmounted; 3/- post free, mounted on canvas in book form; 4/- post free, mounted on canvas on rollers. The map will be published for the West Australian Gold Fields Company, Ltd., by Sir Joseph Causton & Sons, of 9 Eastcheap, London, E.C.

TRULY, necessity and oftentimes taste are responsible for novel methods. It is said that Mr. Whistler completed the ceiling of the celebrated "Peacock Room" in London by lying on his back on the floor and painting with a brush attached to the end of a fishing rod, examining the work from time to time with a pair of binoculars.

Municipal Technical School, Manchester.

THE following questions and answers are presented as typical of the work of a lithographic technical class, and also as possibly of use to younger members of the craft. The questions were set last session, and the answers are by Robert Pemberton, of the Litho Technical Class at the above school. The answers are not presented as models by any means, but as experienced members of the trade will agree, they are very creditable indeed, and satisfactory as shewing the direction of litho technical instruction.

QUESTION I.—*Describe clearly the methods which must be adopted in extreme cases to wash out old work (that is, clear away the old dried ink) from both stone and copper-plate.* (20.)

ANSWER: If the old dried ink on stone will not wash off with turps only, then it is best to add a few drops of carbolic acid to the turps. If this does not clean it, then some kind of dust must be used, such as powdered cuttle-fish bone or charcoal, and if these will not do, try salt. To clean out the ink on a copper plate—this can be done by warming the plate and washing the stone with turps and carbolic acid, or leaving the plate to soak in turps for two or three days. (15.)

QUESTION II.—*By what means can accidentally over-etched or spoiled work be restored, without any resource to re-drawing or repairing by the artist? State the various methods you know.* (20.)

ANSWER: Spoiled or over-etched work can best be restored by washing the job out with turps and polishing evenly all over with a flat piece of snake-stone and afterwards rubbing up with thin printing ink diluted with turps. (10.)

QUESTION III.—*What are the main considerations in rolling-up and printing from grained stone? What is the main difference between the drawing crayon and the writing ink used in lithography, and how is the peculiar character of the crayon treated on grained stone?* (20.)

ANSWER: In rolling up a grained stone it must be first etched with a solution of nitric acid and gum. The acid must not be too strong or it will give a worn-out appearance to the work. If any part is not etched enough it is best to go over two or three times rather than have a strong solution. The stone is allowed to dry and the gum remains there. When about to be printed from it must not be washed out with turps, but impressions should be successively pulled until the required black has been obtained. The chief difference between a crayon and writing ink is that the crayon is hard and dry and is used like an ordinary black lead upon the stone, whilst the writing ink is like a hard cake, and is dissolved in water before using—pen and brush being used for this ink. The crayon, after being put on the stone, lies there and does not form an insoluble compound with the stone (like the writing ink) until it has been etched, the acid converting the soap contained in it into fatty acids which unite with the stone to form the insoluble compound. (15.)

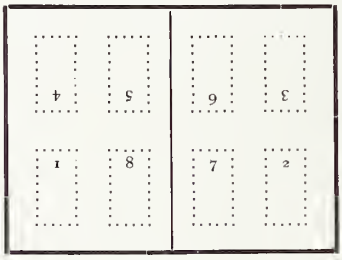
QUESTION IV.—*Give in inches the sizes of the following printing papers:—Demy, crown, super royal, double foolscap, quad crown, and foolscap. If the paper chosen for an order is foolscap, and is to be similar in weight to a royal sheet, at 27-lbs. per ream, what will the weight of the ream of foolscap be? Also shew by sketches the imposition of eight and sixteen pages.* (30.)

ANSWER: Demy, $22\frac{1}{2} \times 17\frac{1}{2}$-in.; crown, 20×15-in.; super royal, 27×21-in.; double foolscap, 27×17-in.; quad crown, 30×40-in.; foolscap, $17 \times 13\frac{1}{4}$-in. or $17 \times 13\frac{1}{2}$-in.

$$25 \times 20 : 17 \times 13\tfrac{1}{2} :: 27\text{-lbs.}$$

$$\frac{17 \times 13\frac{1}{2} \times 27}{25 \times 20} = 12\tfrac{393}{1000}\text{-lbs.}$$

EIGHT PAGES.



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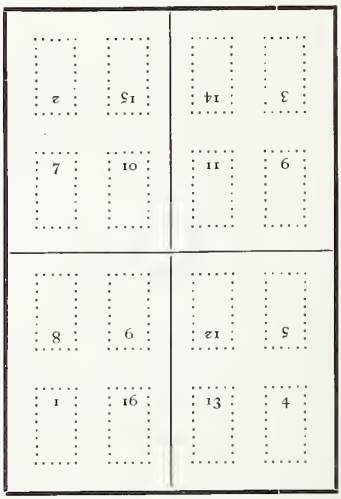

(Shewn as laid on stone.) (21.)

QUESTION V.—*Give as nearly as you can the chemical composition of the following pigments:—Cobalt, chrome yellow, yellow ochre, Prussian blue, vermilion, madder brown, carmine, sepia, lampblack.* (25.)

ANSWER: Cobalt blue—aluminium worked up with cobalt; chrome-yellow—chromate of lead;

yellow ochre—peroxide of iron in clay; Prussian blue—persalt of iron treated with prussiate of potassium; vermilion—sulphide of mercury (cinnabar); madder brown—from the roots of the madder plant; carmine—from cochineal insects: lampblack—obtained by burning oil—animal, vegetable, or mineral, the best being burnt tallow. (16.)

QUESTION VI.—*State the composition and general characters of the following materials used in lithography, and state for what purposes they are, or might be, used:—Soap, resin, talc, izal, carbolic acid, turpentine and terebene.* (20.)

ANSWER: Soap is obtained by treating fat with caustic alkali; a good hard soap containing fatty acids, 78 per cent.; caustic soda, 9 per cent.; water, 13 per cent. It is used in making transfer and similar inks to dissolve the other ingredients, and by artists to help their writing inks to dissolve, if they will not do so readily; too much soap makes the ink slimy.

Resin is the sediment that remains after distilling turps, and is used in lithography for covering the work before etching.

Talc is used for the same purpose as resin, and is a silicate of magnesium.

Izal is a preparation from coal tar, and can be used as an antiseptic in gum, paste, etc. Carbolic acid is a phenol or phenyl alcohol. It is used as an antiseptic, and for its searching qualities, as in cleaning rollers or the dried ink on old work.

Turpentine is an exudation from the pine trees, chiefly in America. It is a carbo-hydrate, and is very searching. It is chiefly used for cleaning rollers, etc., and washing out work on stones, and for dissolving hard inks. It is an essential oil.

Terebene is something similar to turps, being one of the essential oils. It is not so searching as turps, and for this cause it is sometimes used in washing out weak work. It is a very rapid drier, for which purpose it is chiefly used. It dries by evaporation. (14.)

QUESTION X.—*Give recipes for wet-stone transfer paper and for plate transfer paper, and how to make them.* (20.)

ANSWER: For wet stone a transfer can be made from:—Plaster of Paris, 8-oz.; seconds flour, 8-oz.; isinglass, ½-oz. The plaster is stirred in cold water until the setting properties are taken out, and the flour mixed with water until it is of the consistency of cream. Then the flour or paste is poured into the plaster and stirred up well. The isinglass is dissolved in warm water, and a little colouring matter added; it is then poured into the other mixture, and the whole is afterwards strained through a muslin rag. It must be kept warm, and the paper is coated twice. A 25-lb. demy is the usual kind of paper used.

A plate transfer is made in the same manner from the following:—Plaster of Paris, 8-oz.; starch, 8-oz.; parchment clippings, or gelatine, ½-oz.; best glue, ½-oz. The parchment clippings and glue are soaked in cold water before dissolving in warm water. A good soft paper should also be used. (11.)

QUESTION XII.—*Give recipes for plate and re-transfer inks, and describe the method of making them.* (20.)

ANSWER: A plate ink can be made from the following:—Tallow, 4-oz.; palm oil, 4-oz.; shellac, 4-oz.; soap, 4-oz.; wax, 4-oz.; black printing ink, 4-oz. The tallow and wax are first melted in an ordinary saucepan, and the palm oil afterwards. When the fumes thicken, ignite them, and burn for about seven or eight minutes. Before burning, add the soap bit by bit. When you have put out the flames, add the shellac, and melt until it is all dissolved. Add the printing ink the last, keeping the solution in a melted condition. A re-transfer ink, made in the same way, is composed of:—Tallow, 2-oz.; stearin, 2-oz.; palm oil, 1-oz.; soap, 2-oz.; printing ink, 8-oz. The tallow, stearin, and palm oil are all melted; the soap is then added, and the fumes ignited, and burned for about seven or eight minutes. Put out flames, and add printing ink. (9.)

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Society Notes.

SMOKING CONCERT AT MANCHESTER.

ON February 2nd the Manchester lithographic artists and copper and wood engravers met at the "Dog and Partridge," Corporation-street, in goodly numbers to revive the convivial gatherings which have in past years been somewhat neglected. The meeting took the very pleasant form of a tea, followed by a "smoker." After the repast, the chairman of the evening (Mr. J. E. Duke) opened the proceedings with some remarks upon the general welfare of the Society, and the Manchester branch in particular, shewing that the latter had paid large sums in benefits, and contributed a very substantial portion to the accumulated funds of the Society. The musical programme received an introduction in a pianoforte selection by Mr. Brocklehurst. Following on, Mr. A. H. Duke (tenor) rendered several excellent songs. The comic element was ably sustained by Mr. Hickey, Mr. Fred. Durand, Mr. Beaumont, and Mr. Reeder. Mr. W. Holt gave a violin solo, and later in the evening Mr. Lelande (from Sir Charles Hallé's orchestra) contributed two charming violin selections. Songs were also given by Mr. Dixon and others, and Mr. R. Hammersley (of Hanley) kindly accompanied on the piano the greater part of the evening. The music was occasionally brought to a standstill to afford opportunities for Mr. Yoxall (president of the Society) and Mr. C. Harrap (the general secretary) to offer remarks upon the whole bearings of the Society, and to address those who were present and were not already members of the Society. Taken altogether, the evening was an unqualified success, and it shewed that if the natural bashfulness of the Manchester members could only be rubbed off, they might frequently spend equally enjoyable evenings, to their mutual benefit and amusement.

THE YORKSHIRE DINNER OF THE LITHO ARTISTS, ETC.

THE eighth annual Yorkshire dinner was brought to a most successful issue on February 23rd, when a number of the Bradford artists joined in the festivity. The latter would have been present in a larger body had it not been for a serious outbreak of influenza at the printing establishments and other places in Bradford. This gathering was the outcome of the intention so strongly expressed in November last, and it was ostensibly the annual dinner. The menu was well carried out at the Victoria Hotel, and not long after dinner the merriment commenced. The more serious part of the programme was condensed into a few toasts, and resolved itself into some interesting remarks from the chairman (Mr. A. Haigh), followed by the president of the Society (Mr. Yoxall) and the general secretary (Mr. C. Harrap), Mr. Mallyon, Mr. Toby, and Mr. Brady. The "smoker," as is customary in Yorkshire, turned out a very pleasant affair. The songs by Mr. Stokoe are always most acceptable, and he was in good voice for the occasion. Mr. Brady evidenced his happy knack of rendering some of the Gilbert and Sullivan solos, and Messrs. Johnson, Dawson, B. Reston, Vere, and others, as well as the talented pianist (Mr. Jefferson), all rendered their services towards the harmony of a right joyful evening.

"SOCIAL" AT BIRMINGHAM.

THE Birmingham branch of the Amalgamated Society of Litho Artists, etc., held a special open social evening on March 21st, which was well attended by the members of the branch and a large contingent of friends. Owing to the inroads of influenza, much of the musical talent of the branch proper was absent. But those present made up a good programme commencing with a piano selection by Mr. Corbett, followed by songs by Messrs. W. H. Lander, Wallis, Rider, Phillips, Saunders, Horton, and Barker. These contributions included capital renderings of "In Cellar Cool" and "The Diver," by Mr. Barker; "The Mighty Deep" and "In Sheltered Vale," by Mr. Saunders; "In Old Madrid," by Mr. Lander; two first-rate comic songs each from Messrs. Rider and Horton; and good compositions by Messrs. Wallis and Phillips. Mr. W. M. Hutcheson gave the stirring reading of "The Downfall of Poland."

Mr. Hutcheson presided during the business part of the programme, when Mr. Chas. Harrap (the general secretary) delivered a lengthy address upon the workings and objects of the Society. He referred in a very complimentary manner to the steady character of the Birmingham branch, resulting in its present flourishing financial condition. Mr. G. Jacobs (branch secretary) replied.

Mr. Lander conducted the musical programme with general satisfaction.

WE notice that the skylight of the gallery containing the Raphael cartoons at South Kensington has been reconstructed, and that the glasses are now alternately reddish-yellow, blue, and green. On enquiry, it is stated that this is an experiment based upon the excellent researches in colour by Captain Abney, and that it has been the means of illuminating the cartoons in such a way that observers say they are very much improved, the real colouring coming out with better effect.

THE March number of *The Art Decorator* is as full of suggestion as one could desire. Its contents include tasteful designs for painting on porcelain; a study with tritons and nymphs as subject; a useful page shewing old American ornament in colours; two charming decorative panels; and a set of three landscape studies in wash colour. The plates are wonderful value for the shilling.

Trouble in the Lithographic Trade.

A New Union of Litho Operatives.

THE *Westminster Gazette* of February 11th contained the following article, under the heading :—

A Boycott of Foreign Labour Employers Suggested.

The lithographic printers are up in arms again. It is an old story, which has been referred to more than once before in these columns. Capable and industrious lithographers find themselves utterly unable to get work because of the competition of underpaid Continental labour ; and naturally they are wroth with those British employers who send their work abroad in this way to the detriment of the native workman.

An intelligent and well-spoken lithographer who the other day called at the *Westminster Gazette* office, at the request of a number of fellow workmen, like himself unable to obtain work, called particular attention to three large placards announcing a popular entertainment. Three large and two small placards, he said, had been printed in Italy. "In Italy! Just think of it! In Italy!—while British workmen are starving for want of work."

"And this is only one example out of many. There are thousands of posters on the walls of London at the present time, representing in value some £25,000, which have been printed and produced in Germany, Holland, Italy, and anywhere but in the country for which they are intended."

"But what is the cause? Why is it the manufacturers of these things prefer to get them done abroad?"

"Of course, because they can get the work done so much more cheaply. Over here we have a minimum wage of 42s. for a fifty-four hour week. These are the terms enforced by our trades unions—the London Society of Lithographic Printers and the Amalgamated Society of Lithographic Printers—and of course they are more favourable to the workers than those which prevail among these sweated foreigners. Unfortunately, while our unions enforce the standard rates all right, they do nothing, or next to nothing, for their members who can't get work at these terms. They ought to be the ones to do this work which I am trying to do—educate the public, make known the facts, and organise opposition to those employers who persist in disregarding the claims of British workers.

"They do nothing of the kind, and consequently we have founded another society, under the name of the Co-operative Society of Lithographic Printers, with the object of undertaking action of this kind. And if we can do nothing in no other way, we intend to propose to our fellow trade unionists throughout the country a general boycott of those employers who persist in ignoring the moral right of British workmen to British work. But before we can hope to do anything of this kind, we must enlist public sympathy and support, and it is for that reason that some of my mates have asked me to come to you. What you put in for us once before did us a lot of good, and we hope that the result may be the same this time. I am sure the public only needs to know of the facts to be on our side."

Commenting on this, the *British and Colonial Printer and Stationer* says :—"For sound common nonsense, this will take some beating. The lithographers who are thrown out of employment by any cause whatever—whether foreign competition or otherwise—have our sincerest sympathy. And so have the employing lithographers who find their operations hampered by the preference often accorded to foreign competitors. But it never occurs to the narrow-minded ones to look at the other side of the account. The chief complaint is that a certain proportion of the poster work for 'Olympia' has been executed in Italy—'In Italy! Just think of it!' The printer's bill probably did not exceed £200. Well, against this modest sum Italy takes some thousands of pounds worth of work from us. Her stationery bill alone, calculated over five years, ranged from £13,000 to £18,000 a year, against *nil, per contra.* Of all manner of produce we buy from Italy about £3,000,000 per annum, and she buys from us double as much. We give a reduction in black and white of one of the offending bills—if there be more than one. It is a charming piece of work, let it emanate from where it may. We can do as well in this country, but we should hesitate to say we could surpass it. 'In Italy! Just think of it!'

"In the case of Germany, Belgium and Holland, the balance of trade is on the other side ; and we concede that much work goes to these countries, both lithographic and typographic, that might be done at home—if employers, operatives, publishers and users of printed matter generally would co-operate to that end. But to talk of boycotting any employer who uses foreign produce is the rankest nonsense, and not calculated to influence any being with a brain capacity of fifteen inches or over. In the matter of exporting manufactured goods to other countries, we are far and away the greatest offenders—if it be an offence. Suppose that on the principle of 'what is sauce for the goose is sauce for the gander,' other countries agitated against our goods—our £225,000,000 or so per annum—what then? Who would feel the first effects of any interference with the course of trade?

"The intelligent and well-spoken gentleman interviewed by the *Westminster Gazette* asserts that 'there are thousands of posters on the walls of London at the present time, representing in value some £25,000, produced abroad.' We venture to question the accuracy of the intelligent gentleman's arithmetic, and put it to him that he cannot enumerate posters on the walls of London at the present time whose value reaches within reasonable distance of £1,000. Nevertheless, we are so far prejudiced in favour of keeping at home all work that can fairly be executed at home, that we regret that the Olympian authorities did not see their way to place the whole of their poster orders with British houses. They have done better than they did the preceding year, but they might do better still another year."

Our contemporary has rather a rough way of handling the subject, and treating with ridicule the position as placed before the *Westminster Gazette* by one so sorely affected. Men in that position are likely to exaggerate their grievances, and perhaps feel that they are badly done to. In our opinion, the lithographic trade all through has retained a very fair amount of employment for some few years, and that is due in a large measure to the rules of the Societies being adhered to by employers and employés. As to the Continental competition, much of that lies in the hands of the

printers to cure. Employers are not technically educated, and do not know either what paper or what inks to buy for the best-class work. On the other hand, printers and designers have not the taste of our French or German neighbours. We are as a nation considerably behind our friends on the Continent; and although they are prepared to sell us the very best inks, and paper of exceptional quality, yet we are afraid to take up the same tools, and meet them on equal terms. We hamper ourselves by our timidity in exchanging ideas, and working with the same tools. It is this absence of technical education which prevents purchasers and employers putting the necessary confidence in the lithographers of this country, to give them the charge of some of the greatest lithographic productions. However, the time is not far distant when this state of affairs must cease. Time was when practically all the Christmas annual plates were printed abroad, but last year Continental work proved to be the exception; and so it will go on, until all our own lithography will be done by our own people. There must be more speculation amongst the employers; they are too slow to pick up ideas, and still slower in putting them into practice. Whatever the average man may think of our trade, it is at the best a precarious one, built upon the desire for luxury in advertisement. Advertisement is necessary to most businesses, and it is they who support our craft. The skilled artisans in the trade must look to the future for a better prospect, and not be too anxious to heap blame upon causes which scarcely touch the matter at issue.

"Made Abroad": a Suggestion.

ALLUDING to the controversy on Christmas cards and their production abroad, a writer in the *Graphic* observes:—"My appeal to manufacturers is twofold. First, abandon colour, stick to monochrome, and keep the work at home, even if it has to be done by the immigrant alien. Give us original pen-and-ink or wash drawings by artists of repute, and, for the cheaper cards, miniature copies reproduced by photography direct from standard paintings and sculpture or, preferably in the case of paintings, from good engravings. In a word, give the cards an intrinsic and educational value—an interest and a beauty which they do not now possess. Secondly, adopt one or at the most two standard sizes. I do not know what considerations have led professional portrait photographers to the sizes of their 'mounts,' but I have little doubt that these standards are the result of circumstances as worthy of consideration as those which fixed the gauge of a railway or the length of a brick, and it appears to me that the manufacturers of Christmas cards can hardly do better than adopt the measurements of 'carte' and 'cabinet.'"

Exhibition of Photography, 1895.

THE executive council of the Imperial Institute having determined that the United Kingdom section of the Institute will be for the present best utilised, and the resources of the home country effectively displayed, by a series of exhibits illustrative of the progress and present condition of leading industries and manufactures of Great Britain and Ireland, such as the Pottery, China and Glass Exhibition of 1894, arrangements are being made for holding during the forthcoming summer season, 1895, a Special Exhibition of Photography in its Application to the Arts, Sciences, and Industries throughout the Empire. The exhibition will include examples which may be received from the Colonies and India. The exhibition will be open daily (except Sundays) from 11 a.m. until 11 p.m., from the middle of May until the middle of August, 1895 (three months).

The exhibition will be divided into the following seven classes:—Division 1, The History of Photography; Division 2, Artistic Photography; Division 3, Photography as an Industry; Division 4, Photography in its Applications to Industries; Division 5, Applications of Photography to the Sciences; Division 6, Education in its Connection with Photography; Division 7, Miscellaneous Applications of Photography.

Individuals and firms wishing to exhibit in the exhibition may obtain further particulars concerning the division in which they wish to enter on application to the Secretary, Photographic Exhibition, Imperial Institute, London, S.W.

MARCUS WARD & CO.'S premises—Oriel House—in Farringdon-street have been vacated. The firm has taken premises out in the country. McCaw, Stevenson & Orr have also removed their printing establishment to Loopbridge, Castlereagh-road, some three miles outside Belfast. These firms seem to be following the example set by other large printing establishments, whereby they thus obtain a clearer atmosphere, and it is conjectured have less to pay in rent, which is a great consideration in these days of keen competition.

THE ART BIBLE.—Messrs. Newnes, Ltd., have issued the first number of their new publication, the Art Bible. It is to be completed in about twelve parts at 6d. each. The part contains 96 pages, so that the whole work will be about 1,200 pages. There are sixty-four illustrations, several of them being full page. Many illustrations will be taken from well-known pictures, but the majority will be originals for this work. The illustrations in the first part are full of vigour, and can be turned to good account by artists seeking figure studies.

The Arms of the Towns and Counties of Great Britain.

Containing various points of note for the artist on the Art of Blazon.

Cardigan.

Cockermouth.

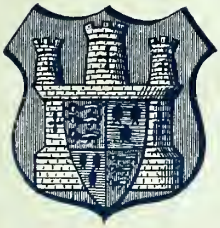
Devizes.

Dublin City.

Cardiff.

Devonshire.

Dorsetshire.

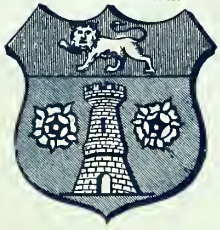


Cornwall.

Essex.

Gloucestershire.

Cumberland.



Great Grimsby.

Our Prize Competitions.

THE BOOKMARK COMPETITION

HAS produced some capital specimens of work, each design possessing points worthy of commendation. The points of novelty and appropriateness form the stumbling blocks of the majority, while in artistic expression, skilful drawing, and attention to both general and detailed effect, many of the designs are meritorious in no small degree. It is worthy of note that, unlike previous competitions, every design entered is so produced in black and white as to be perfectly suitable for reproduction by zincography.

The prize of One Guinea is awarded to

MR. C. J. JENNINGS,
Liverpool,

for design reproduced on this page.

Closely following the prize winner, the design by Mr. H. White, Birmingham, marks him as a skilful exponent of black and white. His design includes a tall female figure appropriately turning over the leaves of a book; a background strongly brought out in solids and whites gives the necessary force and light to the picture. The whole is well drawn, and very closely rivals the design classed first.

Mr. R. H. Tacey, Belfast, submits a well-drawn design representing a Grecian portico, with thoughtful figure gazing upon a bust of some kindred spirit. Its motto of "Vita sine literis mors est" is appropriate, but the design as a whole is not open to the same commendation. The whole conception is architectural in tone and distinctly good at that.

The design by "Manso" shews a draped female as statue symbolical of light. The niche in which the figure stands bears writing materials at foot, and as a whole makes an exceedingly good background. The figure is, however, marred by faulty drawing, the uplifted left arm being particularly open to criticism.

"Bois" has produced a strong and on the whole very effective study in black and white. The shape of the ground design is somewhat original, if not altogether pleasing. Amongst the floriated design is a girl figure with open book. The face is somewhat out of proportion to the size of the body, but the subject obtains full marks in appropriateness.

"Reducto" relies upon the meaning of his design being conveyed by a couple of sketches representing Shakespeare's House and Dickens' House respectively. These are neatly included in laurel branch ornament. "Originality" is a weak point.

"W.M.N." is responsible for a somewhat ordinary subject, nicely drawn. The hackneyed floral, bird, and panel design has little to commend itself as an appropriate bookmark however, and as such, an otherwise pleasing sketch fails to win marks. The drawing and balance of the sketch are decidedly pleasing.

"Caxtonette" shews somewhat doubtful powers of execution in a stiff design, wherein is a reader at table bearing a lamp sending out wonderful shadows. The scroll, bearing a familiar quotation from Bacon, and the "Here You Are" inscription at the head, are, however, sufficient to call for commendation in the points of effect and appropriateness.

COMPETITION K.—We offer a prize of

ONE GUINEA

for the best design suitable for

HEADPIECE

to an article on "Machine Printing."

The design to be in black ink on white card, and drawn in a manner suitable for zinco reduction to about 2½ × 1½-in.

RULES.

1.—All designs may be signed with a *nom de plume*, but the correct name and address of each competitor must accompany each design submitted.

2.—All designs for competition must arrive on or before Saturday, May 11th, 1895. The award will be published in the June-July issue.

3.—Competitors should address designs for competition to The Editor, BRITISH LITHOGRAPHER, De Montfort Press, Leicester, and envelopes should be marked "Prize Competition" in the top left-hand corner.

4.—The decision of the Editor must be final.

5.—The Editor reserves to himself the right to reproduce any design sent in as worthy of mention besides the successful design.

6.—The Editor cannot hold himself responsible for the return of unsuccessful designs.

Trade Notes.

MANY of our readers will be interested in **The Photo-Autocopyist**, a very economical, easy and simple system for the reproduction of photographs, in any colour, of portraits, landscapes, instantaneous views, paintings, machinery, etc. The reproductions are made in permanent printing ink. In operation it is sufficient to soak the Photo-Autocopyist gelatine sheet for a few minutes in a bichromatic solution of three per cent., to dry it in the dark room, and to expose it to the light in an ordinary printing frame, underneath the negative, in the same way as taking a copy on albumenised paper. When it is sufficiently printed, which can be readily seen by opening the back of the printing frame and examining in the usual way, the Photo-Autocopyist sheet is taken out of the frame and soaked in water until the bichromate has been entirely washed out. The sheet thus prepared constitutes the printing surface. The Photo-Autocopyist sheet is then taken out of the water and stretched on the special frame supplied with the apparatus, and inked with the ink roller, the ink only adhering to the indented parts which have been acted upon by the negative; ordinary paper is next placed upon the inked surface and then pressed in the usual office copying press, taken out at once, when an exact reproduction will be obtained. The print is then complete and does not require toning. The average time in completing a print is two minutes. From the printing sheet further prints can be taken at intervals, even after some years. The address of the Autocopyist Company is 72 London Wall, E.C.

THE variety of goods maintained in stock by **Messrs. L. Cornelissen & Son**, 22 Great Queen-street, W.C., is an evidence of the thorough manner in which they cater to the lithographic trade. A glance down their catalogue—a copy of which should be kept handy in every lithographer's office—shews that in every appliance and accessory for artists' and printers' work they are up to date, and supply not only staple every-day goods, but necessary materials for side processes so frequently leading from ordinary litho work. They possess a wonderfully complete list of transfer papers, in all sizes, for colour work, for stone to stone or zinc, for plate to stone, French and Scotch retransfer, photo-litho transfer, photo-enamel paper, and make any kind and size to order. Papers of all classes, for tracing, proof, or drawing, dry and dusting colours, bronzes in infinite variety, and in fact materials for artist and printer for all work connected with the trade. Some half-a-dozen classes of photo-zinco process papers are also included in the firm's stock. Their trade announcement may be seen on another page.

EVEN although a business house possesses the best of facilities for the production of work, yet this is of no avail unless possible customers are made aware of it. Thus the enterprise of **Messrs. Hillman & Nosworthy**, whose trade announcements are now reaching both lithographic and letterpress houses through the medium of this and the sister journal, must surely be recognised. In drawing attention to their trade announcement on another page, it may be mentioned that they have met with much success as lithographic artists to the trade. Occupied with general work, they also make a special feature of estate plans and maps, the accuracy of which is assisted by an evident knowledge of architectural and mechanical construction. Designs for reproduction by lithography, or by half-tone and line blocks, may be obtained for any class of illustrative work, and these are characteristically original and striking. Messrs. Hillman & Nosworthy are prepared to quote prices and submit specimens where necessary.

"Vevers' Photographic Primers" (C. C. Vevers, Leeds; 2d.) form an acquisition of decided value to amateur photographic literature. The primers are made up of a series of practical papers read before the Leeds Camera Club, and are of exceptional value to the amateur inasmuch as complicated technicalities and scientific formulæ have been discarded as much as possible. The series very appropriately opens with "Beginners' Errors," which not only point out the multiplicity of mistakes and failures an amateur is most liable to, but point out the remedy, so that this paper alone, if carefully studied, will form a mine of information, and save the beginner an enormous amount of trouble, time, and expense. The other papers possess similar value, and the whole series may be well recommended to the attention of tyros.

IN estimating the cost of a job, not only take into consideration the actual material and time possibly engaged in its production, but just note two or three oddments which have been omitted from many a printers' list, and eventually proved the basis of a mysterious and considerable loss. Some of these trifles are rent, taxes, gas, water, insurance, office, stamps, stationery, "spoils," bad accounts, depreciation of plant, sorts, collector, office boy, telephone, telegrams, waste, towels, soap, brushes, cartage, alteration of proofs, foreman, pens, pencils, general wear and tear, and so on, almost *ad infinitum*. These are leaks, with a wonderful capacity for enlargement.

HANDSOME OFFER TO DESIGNERS. — Messrs. Marcus Ward & Co. have made an offer of prizes to the amount of £100 for a series of original designs representing the Four Seasons, which must be sent to them at Belfast by June 1st next. Further particulars may be obtained from the firm at Belfast.

General Trade Report.

NOTWITHSTANDING the very serious depression in trade generally, the printing trades maintained a good standard of employment in January and February. The number of unemployed is represented by the following percentages :—

Dec.		Jan.		Feb.
1893 .. 6·1	1894 ..	6·1		5·8
1894 .. 4·5	1895 ..	5·3		4·8

But the trade in March has opened with a very noticeable decline in most districts. This decline has been gradually coming, and can be traced to the depression in every other trade. To be able to judge the large amount of unemployment, the returns from 84 trade societies shewed that in 22 of them there have been 10 per cent. and upwards unemployed ; in 11 others, from 7 to 10 per cent. ; and in 17 others, from 5 to 7 per cent. unemployed. Taking the returns of 84 societies, with a membership of 385,594, there appear to be no less than 30,624 unemployed members at the end of Febuary. This number has been increased by the present serious strike and lock-out in the boot trade.

The following details shew briefly the general state of trade throughout the country ; and, on the whole, it cannot be considered very bad for the printing trades.

ABERDEEN.—Lithography dull, with 13 per cent. unemployed. Letterpress improving.

ACCRINGTON.—Letterpress and lithography fair.

BARROW.—Printing trades moderately busy.

BATH.—Printing trades generally slack.

BELFAST.—Lithography good. Letterpress trade bad. Bookbinding fair. In the four societies of 784 members, there are 53 unemployed.

BIRMINGHAM.—The printing trades retain the same moderate standard as usual.

BOLTON.—Letterpress moderately busy. Lithography declining slightly.

BRADFORD.—Letterpress fair. Lithography, after the abundance of work, has settled down to moderately busy.

BRISTOL.—Lithography declining. Letterpress good. Bookbinding not busy for the season.

CARDIFF.—Printing trades still moderately busy.

CARLISLE.—Printing trades retain the usual good standard.

CORK.—Letterpress and bookbinding dull.

DERBY.—Lithography bad, with 6 per cent. unemployed. Letterpress dull, with 10 per cent. unemployed. Bookbinding fair.

DUBLIN.—Lithography still very dull. Letterpress quiet, with 194 unemployed. Bookbinding fairly busy.

DUNDEE.—Lithography and bookbinding moderately busy. Letterpress satisfactory.

EDINBURGH.—Lithography and letterpress good. Bookbinding declining.

GLASGOW.—Lithography moderate, with over 3 per cent. unemployed. Letterpress dull, with 100 unemployed.

HANLEY.—Lithography good, with 1 per cent. unemployed. Letterpress depressed, with 10 per cent. unemployed. Bookbinding fair.

HULL.—Lithography moderate. Letterpress and bookbinding bad.

IPSWICH, ETC.—Letterpress depressed, with 10 per cent. unemployed.

LEEDS.—Letterpress, 6 per cent. unemployed, bad. Lithography, 3 per cent. unemployed, moderate,

LEICESTER.—Lithography good, some overtime. Letterpress fair, with 5 per cent. unemployed. Bookbinding fairly busy.

LIVERPOOL.—Letterpress, 12 per cent. unemployed. Lithography still fair.

MANCHESTER.—Printing trade all round bad. Lithography has been specially dull.

MIDDLESBROUGH, ETC.—Letterpress fairly busy.

NEWCASTLE.—Letterpress (5 per cent. unemployed) and bookbinders moderately busy. Lithography as usual, moderate.

NORWICH, ETC.—Letterpress slack. Lithography maintains a good, steady position.

NOTTINGHAM.—Lithography not so brisk. Bookbinding quiet.

OLDHAM.—Printing trade dull.

PLYMOUTH.—Printing trade still slack.

SHEFFIELD.—Letterpress improving, though 10 per cent. unemployed. Bookbinding moderate. Lithography as usual, fair.

WOLVERHAMPTON.—Letterpress fair, 4 per cent. unemployed.

Pauperism in February shews a serious rise, the following tabulation giving the best synopsis of the conditions :—

No. of paupers relieved on one day in		No. per 10,000 of the population.
Dec., 1894	339,511	232
Jan., 1895	352,637	241
Feb., 1895	406,381	278
Feb., 1894	339,484	232

Undoubtedly, both the increase in unemployed and pauperism has been aggravated by the severe weather. Coupled with this, both the export and import trade shew very large decreases, and unless the weather and other circumstances soon alter, the year 1895 will compare most unfavourably with many previous bad ones.

EDINBURGH.

TRADE is still good in Edinburgh and district, only one per cent. of Society members being unemployed, with the membership steadily increasing, which is very encouraging at this season of the year.

THE litho technical class is still making progress. Professor Gibson, of the Heriot-Watt College, delivered a lecture on "Acids," on Monday, February 4th. Mr. Wood, photographer, Stockbridge, kindly lent several negatives, and supplied photo-litho transfers to the class to demonstrate with. "Paper Manufacture" was treated of by Mr. Clapperton, of Kendal, on March 26th, and an excursion to Messrs. A. Cowan & Sons' Paper Mill, Penicuick, is arranged for Saturday, March 30th.

MESSRS. G. WATERSON & SONS' employees held their annual soiree, concert and assembly on February 22nd, 1895, in the Literary Institute ; and Messrs. Banks & Co.'s employees their annual dinner on February 8th, at the Melville Hotel.

DERBY.

TRADE conditions remain very uneventful. The depression noticed for so long gives no indication of lifting, and at the present time the Lithographic Society reports four members as unemployed. The collotype branches are maintained in full operation.

LIVERPOOL.

A JOINT excursion of the lithographic, typographic, and photographic technical classes connected with the School of Science and Technology was made on Saturday, March 16th last, to Messrs. Furnival's Printing Machine Works at Reddish. The party included some thirty-five students, with the respective instructors, Mr. J. Goodman (lithography), Mr. Garton (typography), and Mr. Banks (photography). Travelling by special large saloon attached to the 1.30 p.m. train from the Central Station, Liverpool, Reddish was reached *viâ* London-road Station, Manchester. On arrival at the works the party was split into three sections, and under responsible guidance shewn the entire establishment, the engine being kept running to shew the machinery in motion. At the conclusion of the examination refreshments were provided in the draughtsmen's room, and greatly appreciated. On behalf of the party, Mr. Goodman moved a vote of thanks to Messrs. Furnival for the privilege of inspecting their works, and for the pains they had taken to explain the details of working, believing that all members of the party had thus added greatly to their technical information. Mr. Garton seconded the vote, and Mr. Tudor replied for Messrs. Furnival. Mr. Banks took some successful snap shots of the works and the Ship Canal *en route*.

HANLEY.

THE fifth annual dinner in connection with the Hanley branch of the A.S.L.P. was held on Friday evening, February 8th, at the Market Tavern. The general secretary, Mr. G. D. Kelley, J.P., was present, and the kindred societies were represented by the following delegates:—Litho Artists' Society, Mr. David Price; Typographical Society, Mr. J. Clark; Bookbinders' Society, Mr. James Perry. After partaking of a hearty meal, the branch president, Mr. W. J. Rushton, took the chair, supported by Mr. G. D. Kelley (gen. sec.) and the branch officers. After the chairman's opening remarks, the convivial part of the evening was opened with a musical selection by the orchestra. The usual toasts were proposed and duly honoured. Responding to the toast of "The Society," Mr. G. D. Kelley referred to the provisions of the Merchandise Marks Act, which requires a distinctive notice as to the place of origin to be placed on all foreign-made goods, and shewed that it is being cleverly evaded in many ways. It is a well-known fact that extensive orders for printing, lithography, and bookbinding for firms in the United Kingdom are being executed on the Continent, whilst an abnormally large number of our own workpeople at home are unemployed. It behoves every member of the Society to keep a strict eye upon any invasion of this Act.

THE lithographic trade in Hanley is reported as "very fair," all Society members being employed.

THE old School of the Stationers' Company in Bolt-court, Fleet-street, London, are the premises which have been granted the National Society of Lithographic Artists, etc. (London), to carry out their classes in art education, and other matters directly connected with lithography. Some portion of the same building is to be devoted by the London Technical Education Board to the purposes of a school of domestic economy, mainly for the benefit of the girls in the printing offices in the neighbourhood.

A SERIES of articles upon "Figure Drawing and Composition," by R. G. Hatton, commenced in the *Technical World* of January 5th, 1895, and has been continued in the issues of that journal on January 19th, February 2nd and March 2nd. These articles are replete with illustrations, and form an excellent groundwork for artists of all crafts.

THE Society of Arts is offering a gold medal with £20, and a silver medal with £10, for the best photogravure copies of Mulready's picture, entitled "Choosing the Wedding Gown," in South Kensington Museum Gallery. The object of this offer is to encourage the practice of photogravure in this country.

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OUR SUPPLEMENTS.

WITH this issue is included a specimen of printing by what is generally known as THE THREE-COLOUR PROCESS.

The original was a chromo-litho print from *The Art Decorator,* and close examination will reveal the various workings and the manner in which the three colours have combined to give the effect of a much larger number of workings.

There can be no question that most remarkable results are being produced by the three-colour process, and the success it has already attained augurs well for the early future of colour printing.

To summarise much that has been written descriptive of this process, it should be remembered that there are but three primary colours—yellow, red, blue—and from the various combinations of these all other colours are developed. Up to recent times photography did not reproduce the correct relations of light and dark, but modern research has enabled the true results to be determined. Once this was accomplished, it was possible, by the use of coloured screens, to exclude either of the three primary colours from the action of light in the formation of a negative, and on this principle is based the three-colour process. In obtaining a reproduction in colours, three negatives are made, each requiring a differently coloured screen, allowing only the red, blue, and yellow rays respectively to pass. The negatives thus obtained each represent a primary colour, and are printed as such, their superimposition giving the other necessary colours approximately. Perfection is not exactly attained in this operation for various reasons, one of them being that the colour screens, or, as they have been called, "ray filters," being, of necessity, of artificial colouring matters, can only approximate the true colours of the spectrum. Also, the pigments used in the reproduction of the prints are only approximate and imitative.

The critics say a good deal on these two points, but even they must admit that pigments are only efforts to imitate nature; and what more can the artist do? How can photography, using the same pigments, be expected to approach nearer to nature than the artist? and is it absolutely necessary to insist on an exact facsimile reproduction?

Various methods of printing may be now undertaken—for instance, half-tone blocks and collotype—the supplement in question having been produced by the former method, and which is the more popular. In this case three half-tone plates were made from the three negatives obtained as described, and the yellow printed first, the blue and red afterwards superimposed in turn. As to general results, it must be admitted that these are satisfactory, and the fact of the certainty and rapidity of production has been too well demonstrated to be open to any question.

Many capital results have been achieved by using the litho stone to produce the actual prints, but the absence of a perfectly reliable method of making a transfer where the gradation is broken into a fine grain militates against the more general adoption of lithographic methods.

We have frequently been asked to give a specimen of this class of printing, and we trust that lithographers will energetically apply what we have said on so many occasions, and study the three-colour print with the endeavour to adapt its advantages to their art.

THE novel **Cheque Supplement**, shewing seven specimens of inks specially prepared by Messrs. Mander Bros., Wolverhampton, is intended for essentially practical use. It requires no homily of ours to urge the absolute necessity of special care in printing this class of work, nor the equal necessity of preparing for it by obtaining suitable materials. If all printers were to use, for instance, the class of inks shewn here by Messrs. Mander Bros., forgery of bank cheques must become rare, for in whatever colour this cheque ink is provided, it is in every instance quickly susceptible to the action of acids and alkalies, the use—or shall we say the misuse—of which is known to the members of the clever gangs of workers whose industry and ingenuity applied in another direction would make them prosperous, while retaining their honesty. Most printers have orders for cheque books in hand at one time or other, and the position of being prepared to use these detective inks when required must inevitably assist the reputation and promote the business of such as are furnished with the material provided by the famous Wolverhampton ink manufacturers.

THE current issue contains a further series of **Public Arms'** designs, intended for the use of artists. In very many instances have we learnt of the great utility of these armorial designs, for it is surprising what use may be made of them in general and special jobs. Artists and employers who have filed their copies find them of value in "roughing out" sketches to suit the tastes of various customers, and others would be well advised to retain their copies for similar purposes.

THE Chromo-lithographed Portrait Supplement announced in last issue as intended for insertion with this number has been delayed in preparation, and thus cannot be included with the current issue as was hoped. Every endeavour will be made to complete the work in time for the following number.

THE MAIN STREET, GRÄTZ.

Half-tone Block by C. Angerer & Göschl, Vienna.

The Imperial Institute Exhibition of Photography

IN ITS APPLICATION TO THE ARTS, SCIENCES, AND INDUSTRIES.

THE collection of exhibits arranged in two of the galleries of the Imperial Institute, and which was formally opened on May 11th last, teems with interest to all concerned in the application of photography to arts and crafts. It may be that photography in itself is not adequately represented. We are told it falls very short of perfection in this particular; but artists, lithographers, and all concerned in engraving, lithographic and letterpress printing will find therein much of interest and educative value. It is regrettable that the exhibition should have been located out at South Kensington, away from business centres, and almost as unfortunate that the Imperial Institute authorities should have so placed the exhibits that the visitor requires quite a series of instructions or a guide to find the exhibition at all.

A large number of exhibits on screens and in cases, with some few working plants, occupy the floor of the gallery, and some of the walls are literally covered with framed examples of photographic and otherwise printed work.

The Historical and Educational Divisions are arranged in the Upper Central Gallery East, and here most interesting specimens, marking the results of early photographic research, with many old prints, serve to indicate the progress made.

In the same gallery an Alpine Section is wholly devoted to photographs of Alpine scenery. A collection shewing the development of the hand camera, organised by Mr. Henry Sturmey, editor of *Photography*, receives much attention.

The North Gallery, however, contains the bulk of the exhibition. In Room I. the Ordnance Survey exhibits of photographs, negatives, plates, and scale maps, make a good show; and though technical to a degree, are wonderfully interesting.

The Photo-Micrographical Section contains photographs from microscopic views, particularly interesting to the scientist and naturalist, apart from the photo-micro value. Here are also many photographs of the heavenly bodies and meteorological phenomena, taken at the various observatories.

The Chemical Department, Royal Woolwich Arsenal, has many views of appliances, and shewing effects of test and accident, with various photographs interesting to archæologists; other interesting specimens, such as illustrating underground photography and methods of identifying criminals, are also given.

The Photo-Mechanical Section is, perhaps, of greatest interest, not only to all connected with printing, but to photographers, who will find much worthy of attention in examining the methods by which photos are reproduced for printing on the machine. Many prominent firms of engravers shew the processes and stages by which the completed block is arrived at. For instance, the Meisenbach Co., Ltd., besides many specimens of work produced from their blocks, shew in one section: (*a*) photograph from which negative was made; (*b*) half-tone negative from this photo; (*c*) print on zinc from negative; (*d*) zinc plate after etching; (*e*) impression from plate. A similar series on copper is shewn by Messrs. Vincent and Hahn, on brass by the Acme Tone Engraving Co., and on zinc and copper by various other firms. Photo-lithography in line is illustrated by a "transfer" from block, transfer laid down on litho stone, and print from same, shewn by Messrs. Carl Hentschel & Co. The swelled gelatine process is illustrated by a series of stages. In another place, photography on wood is illustrated by some capital examples, made more useful by shewing some of the blocks partly engraved. Another section shews how to transfer tints to line blocks, the after-treatment of zinc and copper blocks, and the different stages in the multiplication of blocks by electrotyping and stereotyping.

Collotype receives much attention; gelatine, with the various apparatus and material, and stages in the processes, shewing the details of the work. Messrs. Sprague & Co. shew many examples of their ink-photo process, and photogravure and Woodburytype are well illustrated.

Messrs. Penrose & Co.'s exhibit is designed to shew as far as practicable the leading requirements of the workers in photographic processes, and in this particular line Messrs. Penrose undoubtedly hold the field. The camera shewn is a fine example of the firm's work. There are many features of this camera which the expert in this business will appreciate. It is supported on a swinging bed, suspended by ropes from the roof beams, and at one end of this bed is the board on which the copy is pinned. Another important feature of interest is a case of ruled screens for the half-tone process, manufactured by Levy, of Philadelphia, for whom Messrs. Penrose are sole agents on this side. These screens are cut on glass with a diamond point, set in a very accurate dividing engine, the number of lines to an inch varying from 55 to 200. One of the screens shewn measures 27-in. square, and is the largest in Europe. Its value is about £100. A set of Carbutt's colour screens is shewn. These are red, green and violet glasses; and it is claimed that by placing them behind the lens in copying coloured objects all the colours of nature can be rendered in three printing blocks made from the resulting negatives. Another case illustrates the possibility—often denied—of using

gelatine dry plates for process work. Some ingenious machines are also shewn. The Pantographic Router is a machine for milling out large white spaces in engraved blocks, saving the time which would be occupied in tediously etching out with acid. The machine is of American build. Essentially, it consists of a tool-holding arm, which moves like a pantograph over any part of the bed on which the work is clamped. Set in a chuck on the end of the arm is a drill-shaped cutter, which revolves at the rate of eight or ten thousand a minute, driven by belting from the counter-shaft. A Siemen's one h.-p. electric motor supplies the power. Another machine is a combined saw and trimmer, its object being to saw and plane up the ends of the wood blocks on which the engraved plates are mounted. A little machine which is of great interest is an elliptograph, for cutting or tracing ovals of any proportions. With this the border lines of oval-shaped blocks are ruled. There is also a whirler, for coating plates with the sensitive fluid. The plate being fixed on the bed of the machine, and a pool of liquid poured on, the coating is spread by the centrifugal force of the whirling motion. We can hardly describe in detail the multifarious things which are shewn on this interesting stand; all are of real interest to the process worker, if not to the lay public. There is also in operation a couple of platens by Voirin, specially made for collotype work. Further particulars of them are given elsewhere on this page.

In various parts of this gallery prints from half-tone and line blocks in monochrome and colours shew the degree of perfection attained by engravers and printers. The Swan Electric Engraving Co.; André & Sleigh, Ltd.; The Meisenbach Co., Ltd.; Messrs. John Swain and Son; Messrs. Garratt & Walsh; The Acme Tone Engraving Co.; Hare & Co., Ltd.; Messrs. Husnik & Häusler; Messrs. Angerer & Göschl; The Societé Anonyme; Messrs. Carl Hentschel and Co.; Messrs. Stevenson & Ogilvie, and others, shew their productions. Amongst the prints, Raithby, Lawrence & Co., Ltd., shew a series of cases of printed specimens from blocks by various engravers. These are in colours—from two to seven printings—and in monochrome; while an instructive series displays the same block printed on many different classes of paper, thus practically proving their suitability or otherwise for the work.

The exhibit of photo-ceramics presents many specimens of this dainty and pleasing work, the apparatus used in its production being also shewn. We saw Mr. Ethelbert Henry give a capital demonstration of the process—one of a course given during the exhibition. A fine series of specimens demonstrates the progress made in photography in the colours of nature, the "three-colour" printing process being illustrated by negatives, blocks, and impressions.

In Room VI., the School of Photography of the Polytechnic Institute, Regent-street, has a large working exhibit, shewing the full procedure adopted by process engravers. Near by, Waterlow & Sons, Ltd., besides many show cases and frames of printed examples, have a complete working exhibit of the collotype process, and an ingeniously contrived exhibit of the Woodbury print process, both producing first-class work. Mr. Charles Burdick not only shews many splendid specimens of air-brush work, but by practical demonstrations further proves the undoubted value and artistic capabilities of his appliance.

Historically, the exhibition is of the greatest interest, and probably never before have so many valuable exhibits of this class been brought together.

A Collotype Platen Machine.

In our description of the exhibition at the Imperial Institute, reference is made to a collotype platen machine shewn by Messrs. Penrose and Co. This machine may work as great a revolution in collotype printing as did the Cropper in letterpress work. Close by the stand where this machine is shewn, Messrs. Waterlow illustrate collotype printing on a wooden hand-press, producing good work undoubtedly, but the contrast between this and its modern competitor is striking, and irresistibly reminds one of the analogy in typographic printing of the difference between the old wooden presses of Caxton's time and the modern platen treadles. Hitherto there has been no middle course for collotype printers—either they must be content with the hand-press, or they must go in for an expensive cylinder machine. Voirin's Pedal Collotype Press evidently fills the gap. It does not look very different from the treadle machines used in letterpress printing, but closer examination reveals several distinctive features. The impression for printing from the gelatine film on glass plates must be delicately adjustable and elastic. These points are secured, as well as great evenness over the whole bed. A gripper runs along the whole length of the top edge of the platen, its object being to take off sheets which have a tendency to stick to the plate. A cut-out paper or parchment mask, stretched on a frisket frame, is interposed to secure clean margins. The rolling power consists of two compo and two leather rollers, the latter traversing the plate first. There is no ink-duct, on account of the small supply of ink necessary, but effective distribution is secured by the centre and outer edge of the ink-table revolving independently. For damping and otherwise treating the plate the bed can be brought to a horizontal position. The No. 3b machine shewn practically prints a 15 × 12 plate. The rate of production is 150 to 400 copies per hour.

PHOTOCHROMOTYPE IN THREE WORKINGS.

REPRODUCED FROM A CHROMO-LITHO PRINT

BY KIND PERMISSION OF THE PUBLISHERS OF "THE ART DECORATOR."

Three Inks used in printing this Supplement.

DE MONTFORT PRESS.

Photo-Ceramics.

All interested in any degree with the photographic profession will appreciate the efforts being made by our contemporary, *The Photogram,* to set a new photographic fashion. Photographers complain of the unsatisfactory and depressed state of the business side of their art, and artists and printers can sympathise in the endeavours put forth to popularise genuine high-class work. The direction taken by this most praiseworthy effort is that of reviving and popularising that most exquisite and least perishable of photographic processes, the production of ceramic enamels.

By exhibiting specimens of ceramic enamels, by demonstrations of the process, by instruction on the methods involved, and in various other ways, is the revival of ceramic enamel work being advocated as a way out of "Darkest Photography." Thus many of our readers will have more than a general interest in this beautiful process, and some particulars of it may be of use.

WHAT ARE PHOTO-CERAMIC ENAMELS?

is a question that is being asked by many at the present time, and one which it is difficult to answer in a few words, for the name embraces a very wide range of art productions. A rough definition would be pictures produced by photography, upon porcelain and kindred surfaces, and caused, by furnace heat, to become an actual portion of the surface itself. These photo-ceramic pictures are by far the most beautiful, as well as the most permanent productions of photographic art.

AN AMERICAN REVIVAL.

Some few years ago Geo. G. Rockwood, a leading New York photographer, drew the attention of the artistic public to photo-ceramic work and its great decorative value. He at once succeeded in setting quite a fashion for photo-ceramics, and much of his work, on dessert plates, wine glasses, etc., as well as on the smaller metallic plaques, to be set in brooches, lockets, etc., is very highly prized.

A BRITISH REVIVAL.

Early in 1895 *The Photogram,* with a number of leading British photographers, decided that nothing would more surely advance the general appreciation of the highest possibilities of photography than turning the public attention to the beauty and permanence of photo-ceramic work. A number of those interested in the subject (in all parts of the country) gave their earnest attention to the simplification of some of the details of the ceramic processes. By correspondence and mutual help, some of the difficulties were removed, and no doubt progress in this direction will still be made.

That the importance of the movement was generally appreciated may be gathered from the fact that the Council of the Imperial Institute Photographic Exhibition set apart a special section for photo-ceramics, and arranged for no less than thirty-six demonstrations of the work during the course of their exhibition. Other exhibitions and photographic societies have similarly taken up the work, and there seems every prospect that photo-ceramic enamels, properly made, and from the best of negatives, will be popular wherever shewn.

THE POWDER PROCESS.

The photographic image is produced by a deposit of vitrifiable colours, such as are used in china painting, and is formed upon a very sensitive film spread upon a piece of plate glass. When the picture appears in all its true gradation (commonly called "fully developed"), it is coated with a film of collodion. This film has a contractile power sufficient to firmly hold the powder independently of the original sensitive film. This extremely delicate film, with its adherent powder picture, is then stripped from the plate glass and floated upon the china, tile, or enamel plaque which is to form its final support. It is then dried, retouched, and decorated as required, and finally submitted to intense heat in a muffle furnace or a china kiln until the colours are completely vitrified. It is then retouched and glazed as often as may be necessary—being fired after each operation—and is then complete. In its final stage the picture is formed of imperishable metals or earths upon a suitable base, protected upon the front and back with a coating of molten glass.

THE SUBSTITUTION PROCESS.

In this process a plate of glass is triple-coated with collodion, sensitised, exposed in the copying camera, as in lantern-slide making (a negative being used to copy from), and developed into a transparency. The delicate film is stripped from the glass, washed, and then toned in a bath of gold and iridium, which metals partly replace the silver of the original image. The film is washed, soaked in a faintly alkaline solution, washed again, floated on to the plaque or other support on which it is to be fired, thoroughly dried, and then "fired" in a muffled furnace. This fixes the image, which then must be completed by from five or six to a dozen coatings with porcelain glaze, each of which coatings must be fired in turn. The manipulation of the delicate film requires the greatest care, and the firing requires not only care, but also great judgment and experience, for by too much or too little heating, or by sudden heating or cooling, the work may be ruined at any stage of any of its six to a dozen firings.

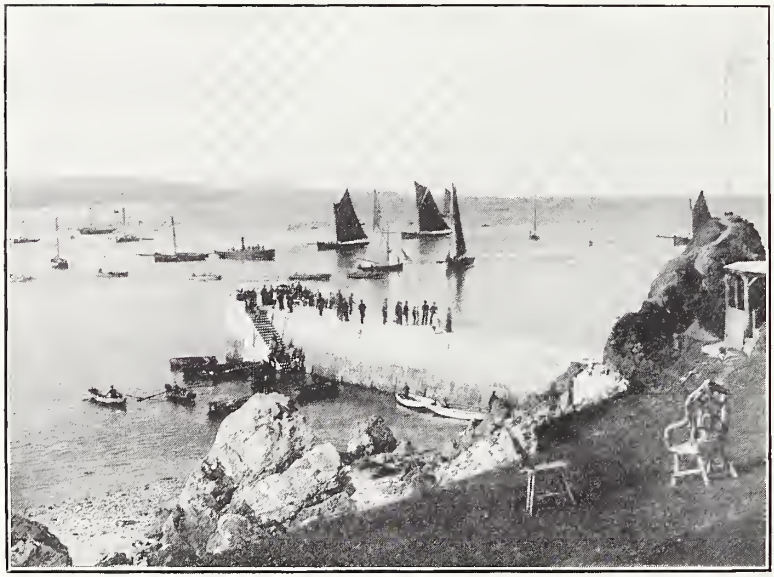
APPLICATIONS OF PHOTO-CERAMICS.

These beautiful pictures, burnt into china, or into a china enamel on metal support, and afterwards glazed with a coating of transparent enamel (really a glass), are so durable that nothing short of breaking up the support can injure them. Hence,

in countries where they are already popular, they are applied in innumerable ways. Every class of tile, whether surrounding a fireplace or mounted in silver as a teapot stand, can be decorated with the image of anything that can be photographed. Cups and saucers, ornamental vases, dessert plates, or other articles of china, wine glasses or tumblers, glass or china lamp shades, and even the glass of memorial windows may be adorned with family portraits.

USUAL APPLICATIONS.

The more general and certainly the most attractive applications of photo-ceramic work, are to small plaques of fine china enamel on a metal basis, suitable for framing for the drawing-room table, or for mounting (in the smaller sizes) in brooches, lockets, bracelets, etc. The delicate detail in the small work far surpasses that of the most skilfully painted miniatures, and the truth of resemblance of the photographic image is as much superior to usual hand work, as the permanence of the enamelled metal plaque is to that of ivory.



By permission of] *[Messrs. Grogan Bros., Torquay.*

BABBACOMBE REGATTA.

A CONTEMPORARY pertinently asks: When will our architects overcome their modesty and insert a *date and signature stone* on the façades they design? Artists and sculptors sign their work; why should not architects do likewise? Our streets would at once become more interesting and instructive, both to us of to-day and to future generations. Perhaps, if it became the custom to sign buildings, bad designs might become fewer, and credit would be given where credit is due.

The Decadence of the Valentine.

LITHOGRAPHIC printers must be included amongst those lamenting the decadence of the valentine. On other than sentimental grounds, the vanishing valentine must be regarded as a loss to the community, for its production necessitated the profitable employment of capital, and a large amount of business amongst printers and those allied with them in its production.

An illustrated article in a recent issue of the *Strand Magazine* is full of interest to all thus concerned in an industry described as almost extinct. The article in question states that practically there is but one firm left in the valentine trade, namely, Messrs. Goode Bros., of Clerkenwell. The astonishingly rapid decline of the valentine within the past ten years brought ruin to many a wholesale manufacturer to whom the trade was worth perhaps £20,000 a year, between the years 1870 and 1875—the golden age of the valentine. At this period a single maker would keep six designers and eighty girls employed on valentines all the year round. Rice paper from China was brought by the shipload, plush in wholesale quantities of 9,000 yards at 2/- per yard, and silk fringe from Coventry in bales of a hundred gross of yards. Twenty years ago, too, the big valentine dealer's turnover was £1,000 a week during the three months of the season, and in his workrooms a quarter of a ton of the finest white gum disappeared in the dainty trifles. Four well-paid male artists designed the "comics"—mainly trade skits and domestic incidents—and these were reproduced on 1,500 reams of paper. The machines were kept going night and day, turning out a million caricatures a week, of which some 5,000 gross were despatched to Australia by sailing vessels in May and June. From a hundred to a hundred and thirty different comic designs were produced every year, and one house would have five smart "commercials" shewing the pattern books to retailers in all parts of the Kingdom.

THE Manchester City Council has resolved to accept the tender of £140,000 for the erection of the new Technical Institute.

The World's Fair Certificates.

PRESIDENT CLEVELAND and Secretary Gresham have signed their names on the original copy of the certificates which are to be sent by the United States to the various governments of the world which sent representatives to the world's fair. Their signatures will now be engraved in facsimile on the plate from which the fifty or more certificates are to be printed.

It is said at the State Department that this plate is the most beautiful example of engraving ever made by this Government. The certificates are to be about twenty-four inches wide by thirty inches long, and of the heaviest parchment. At the bottom is a long boat, like the primitive Indian canoe, with four figures representing Europe, Asia, Africa, and Polynesia, rowing. A figure of Columbus stands in the stern holding in his extended hand a globe with a Roman cross planted on the top. Along the side of this boat hang the coats of arms of the seven principal European powers. On the left side is a figure of Fame, with a trumpet in one hand and a wreath in the other, with which she is about to crown America, who sits leaning comfortably back on a buffalo lying down. America gazes with an expression of supreme satisfaction and pride on a picture of the world's exposition, which forms the main part of the top of the drawing. On the other side of this exposition picture three figures are sitting in comfortable positions on the ground, representing the Indian, the negro, and the white man. Along the sides of the certificate in the scroll are the names of the countries of the world—the American countries on the left and the European on the right. In the upper left-hand corner there is an allegorical female figure representing Machinery, and in the right-hand corner one representing Art is a work of art.

The whole effect of the picture is most striking and artistic, and a credit not only to the designer, Will H. Low, whose name appears in an obscure corner of the scroll work, but to the Government. The text of the certificate follows: "The President of the United States having been authorised by an Act of Congress approved August 18th, 1894, to signify to the leading representatives of the various countries which took part in the World's Columbian Exposition, the grateful appreciation of the Government and people of the United States of America for their valued participation in the commemoration of one of the most important events in human history, now, therefore, I, Grover Cleveland, President of the United States of America, have directed the making of such acknowledgment to ——, in token of the high esteem which the President and people of the United States put upon his efforts in furthering the success of the said exposition."—*B. & C. Printer and Stationer.*

The Utilisation of Decorative Art.

IN a paper entitled "The Outlook of Decorative Art in America" in *The Forum,* Frank Fowler foresees the good time coming when Americans will be as alert as ancient Athenians in utilising opportunities for decorative art supplied by public buildings. Those of us who wearily endeavour to discern the name of a station from amongst the promiscuous multitude of advertisements, may look forward to a less harassing time coming when we grasp the features of this hopeful and fascinating picture. For instance, the writer says: "I expect to see even railway stations become a factor in disseminating a taste for the fine arts. Few places could be made more inviting to high effort on the part of the decorator than these utilitarian structures. Here the waiting passenger—the untried youth starting out to face the world, and the newly-landed emigrant—might find something in these pictured panels to cheat the hour, stimulate ambition, or to encourage hope. Stations should be built to accommodate this work; and as a means of carrying art's message to the masses this method would be unsurpassed, thronged as these places are daily with hosts which scatter to the four quarters of the land. Our banks might also be appropriately decorated; for subjects suggesting the various business activities that create them, and from which they draw the 'sinews of war,' may be illustrated on their walls with much effect and pertinence. And where could themes from history, biography, the classics, be more fittingly delineated than on the walls of institutions of learning?"

In similar strain our contemporary *The Amateur Photographer* says that it must have struck many an amateur leaving London for fresh fields and pastures new this sunny Eastertide, how dreary and dismal most of the great termini are. Architectural pretensions few of them have, as the railway companies seem to think that any hideous shed is good enough for passenger accommodation in this wealthy metropolis of ours; though at Leicester and some other provincial towns of importance the higher decorative arts are applied to the adornment of the stations.

Some good and effective photographs (in carbon for choice, on account of its vigour and variety of colour) illustrative of the scenery of the line and its branches, would wonderfully brighten up the dulness of our great railway stations, and bring money into the coffers of the companies by tempting the tourist into the regions accessible by their system. The Great Western have already done this to a moderate extent, but more could be done, with profit to the company and pleasure to the passengers. The carbon printers would combine both pleasure and profit. A new order of combination printing, is it not?

American Printing Inks.

THE following reference to inks and colours in general use made by the *National Lithographer* is of interest as shewing American opinions of ordinary material, and may be read alongside the serials in our columns treating exhaustively of colour :—

"The use of cheap inks has done more to lower the standard of artistic lithography than many people are aware of. The practised eye readily detects the difference between good work and poor as exhibited in the innumerable showcards, labels, wrappers, hangers, posters, and advertising novelties, which decorate—or disfigure—our shop windows and walls, exterior and interior. But there is an equally potent, though immature and untrained, factor in determining what is good and what is not which is displayed in the taste of the thousands of American school boys and girls who are owners of scrap books containing collections of lithographic products. This crude appreciation of art may have been originally engendered by a shopkeeper whose habit it is to enclose a 'souvenir' (with his name printed on the back) in every parcel of dry goods or groceries he sells. Frequently these cards find their way into the hands of the youthful connoisseur, only to be cast aside as unworthy of a place in the cherished collection. The reason is to be found in the blurred or faded appearance of the subject, which is due to the use of cheap colours. Fugitive colours fade away on exposure to sunlight, and thus the artistic effects are lost. To first incur the expense of a fine art drawing or a handsome specimen of stipple work, and then destroy it by printing with colours that fade, is harrowing to the soul of the artist who loves his art for art's sake.

"A good crayon black ink can be purchased in New York at from $2.50 to $5 per ℔. Most of the crayon black used by provers in all sections of the country costs less than $1.50 per ℔. The writer knows this to be a fact, as he has sold this class of goods to nearly all the houses in this country and Canada, and always gave first-class value for the money. How many drawings have been spoiled before a good proof was obtained, because the prover did not have good ink to work with? How many transfers have been failures because of the inferior quality of the black ink used in reducing the transfer ink, or rolling up the transfer after it is put on the stone? And who suffers the loss? The proprietor, of course.

"What is called good black for printing commercial work can be purchased from any of the ink manufacturers at 75 cents per ℔., but it costs more money to make the best, and a fair price would be $1.50 to $2.50 per ℔. We have seen litho black (imported from Scotland) sold at 25 cents per ℔., and the purchasers were satisfied to run it on a mill so as to make it work half well. We have seen thousands of impressions chopped up and sold for wastepaper, as the result of its use. Again, who is the loser? The proprietor, to be sure.

"All colours should have a suitable base, and among the finest grades in use in America are vermilion (quicksilver), carmine, madder lake, indigo blue, cobalt blue, Prussian blue, milori blue, sienna, yellow lake, cadmium, etc.

"The price of vermilion has of late been lower than ever, but strange to say, purchasers are still looking for cheap colours to substitute for it. Vermilion when properly prepared will not wear the transfer or tint the stone, and there is no waste; you can put 95 to 98 per cent. of it on the sheets of paper. In most of its substitutes you have from 25 to 60 per cent. waste, besides the delay in fixing up transfers and making new ones. At the present price of quicksilver, vermilion can be sold at a fair profit for $1 per ℔., but substitutes, which the maker puts on the market because lithographers are looking for something so cheap that nobody else can obtain it at the same figure, are sold at 45 cents.

"Most lithographers are satisfied to pay for good colour, and are aware that substitutes are not the best, yet they continued paying $1.25 for brilliant reds when quicksilver vermilion sold down to 75 cents and even lower figures.

"Cochineal red and carmine are brilliant lakes and permanent, but the rush for cheap reds relegated them to disuse. Madder lakes are cheaper and permanent, but seldom brilliant, and there is not much call for them. Indigo blue is chiefly obtained from a plant grown in India, and has been used by European chemists to produce various shades of blue. It is expensive as a pigment. Other and more desirable shades can be obtained at lower prices. Aniline blues are fugitive, and however brilliant at first, they disappoint the pressman by the general results. Grays mixed from aniline blue will fade in short order, the sienna and other pigments holding but a small proportion of the blue. The lithographers of America complain of ultramarine blue, but most of our ink houses have struck the system of preparing this pigment so that it works well.

"Sienna is an Italian earth; the best quality can at all times be obtained at 35 to 50 cents per ℔., but our American chemists produce an article which is sold at 6 cents. Well-ground sienna will print as well as good black ink.

"If the trade is to continue and hold its exalted position among the graphic arts, good work must be given to the public, or they will turn to one or the other of the many new processes that are crowding our trade for patronage, and should defeat occur, no mistake will be made in charging it to cheap colours."

Sunset and Dawn.

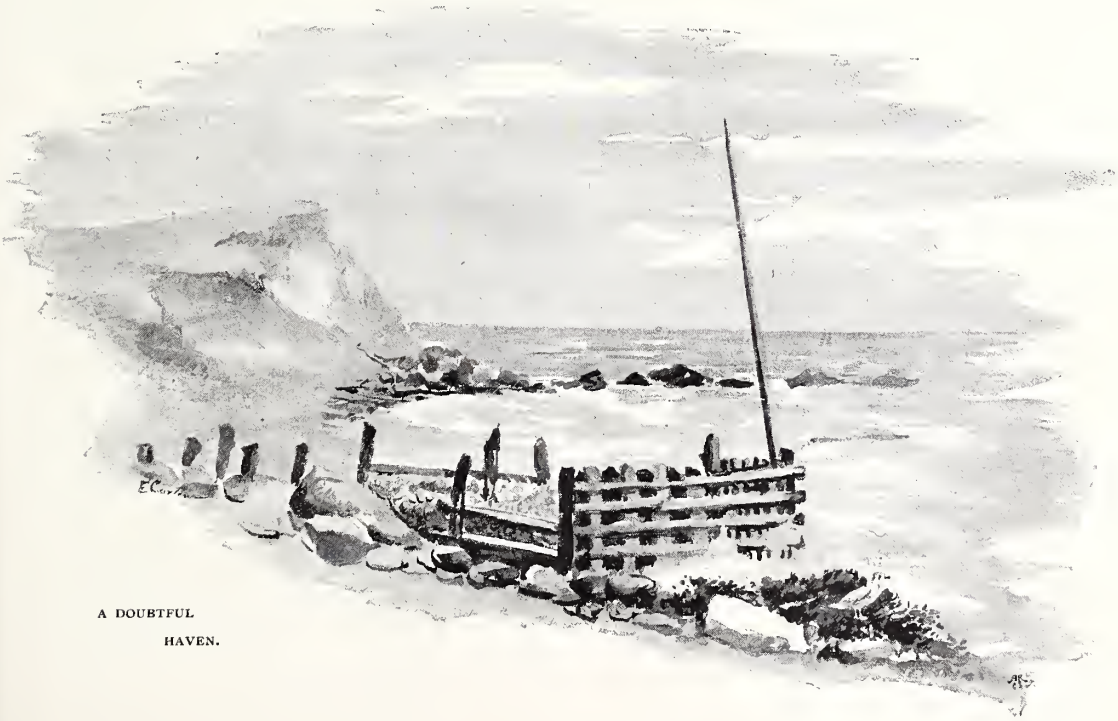
UNDER this title Mr. Robert Blight contributes a most interesting and valuable paper to the *Sunday Press,* and as useful to all concerned in light and colour we reprint for the benefit of readers :—

It is a well-known fact that a ray of light has its direction changed in passing from a lighter to a denser medium. This is called "refraction." It is just as true if the ray passes from a denser to a lighter medium, and you may try a simple experiment in connection with this. Place a coin in a basin, then draw back until you barely lose sight of the coin. The straight line, or ray, between your eye and the coin is intercepted by the edge of the basin. If you could only bend it so that it could get over the edge you could see the coin. Get a friend to pour water, which is a denser medium than air, into the basin, and the coin leaps at once into sight. The ray of light has been bent in passing from the denser to the lighter medium.

We may express the law of refraction thus : A ray of light entering a denser medium, the surface of which is horizontal, is bent nearer to a perpendicular to that surface. You will readily see that if we suppose the atmosphere to be composed of concentric layers the path of a ray from the sun, the moon, or the stars would follow the sides of the polygon. Shorten these sides indefinitely by diminishing the supposed number of concentric layers, and the path becomes a curve. As we see in the direction of a tangent to that curve, the object we look at appears higher than the point from which the ray started.

We must also realise that when a ray of common light is refracted it not only has its direction changed, but it is decomposed into longer and shorter waves. Perhaps it would be better to say "dispersed," rather than "decomposed." We know that when such a ray is refracted through a prism and is received on a screen, we do not get a spot of white light, but a band in which are arranged "the colours of the rainbow." This is called the spectrum, and the order is always the same, no matter what medium is used in the prism. The colours in the spectrum of sunlight range from red through yellow, green, blue, violet, and indigo to lavender. Outside the red and outside the lavender there are other rays, invisible to our powers of vision—the heating rays and the chemical rays, respectively—but they do not concern us now.

We must also distinguish between two kinds of light, skylight and sunlight. Skylight is a portion of the light of the sun scattered (dispersed) by small particles floating in the atmosphere. Sunlight is the light of the sun itself borne on waves from the body of the sun to our eyes. If we turn our eyes on a clear day in any direction but that in which the sun is, we see the deep blue of the skylight. It is visible also at night, for the earth is but a minute ball in the vast light of the sun, and even the shadows are partially illuminated. Even on the darkest night there cannot be that absolute darkness which implies the absence of all light.



A DOUBTFUL HAVEN.

This sky-blue is due to the presence of particles infinitesimally small, which scatter the blue rays chiefly, and so give us the sensation of blue. The greater the number of the fine particles that are encountered by the sunlight, the greater will be the scattering and the bluer the sky. As you ascend the highest mountains the air becomes rarer, the particles become fewer and fewer, the sunlight passes on more and more undispersed, until at the summit of the mountain the dome of the sky is black with the blackness of space. I have said this much to emphasise the necessity of recognising the existence of these particles.

We will now approach the study of what we may call the chromatic aspect of the sunset and the dawn. We must here remember that refraction does more than bend the rays of light. It disperses them according to the refrangibility of the colours, that refrangibility being least at the red end and greatest at the opposite end of the spectrum; in fact, the atmosphere performs the functions of a prism under certain conditions. It is to this scattering of the rays of light that we owe the peculiar softness of light which accompanies sunset and sunrise. This softness you can test yourself by viewing a sun-bathed landscape through glasses variously tinted.

Let us now refer to the diagram suggested, of a circle to represent the earth and shaded colour or concentric layers of different shades to represent the atmosphere. Take a point to represent our position on the circumference of the earth, and another point on the diameter produced passing through us to represent the sun's position at noon. You see that its rays, in order to reach us, pass through our atmosphere. A tangent to the circle through our point will represent our horizon. Take different points from the vertical line to the horizontal line to represent the sun at various times after noon. Notice how the path of a ray increasingly lies through dense portions of the atmosphere. Now accurate calculations have been made with this result, that at ninety degrees above the horizon the light of the sun passes through one atmosphere; at seven and one-half degrees through density equivalent to eight atmospheres; when nearly setting to thirty-two atmospheres, and on the horizon to thirty-five and one-half atmospheres. On a clear day in summer you cannot bear to look at the sun at noon without protection of some sort for your eyes, for this light passes through one atmosphere only; when he is setting, however, you can look straight at his eye. In fact, when setting the sun is four hundred and twenty times less luminous than at noon on a summer's day. But even at that season when water-vapour is present in abundance we can bear to look upon his disc; and in winter time, because his path is lower in the heavens, we may observe him unprotected at almost any hour of the day.

When the atmosphere is heavily charged with moisture, as in the case of fog or mist, let us look down a gaslighted street. The lamps farthest away are red and dim, half-way down they are orange and brighter, close by they are of the normal yellow colour. When there is no fog the lights are pretty much of the same tint, from the nearest to the farthest, and the light differs in intensity only owing to distance.

Let us now make a simple experiment which you can readily understand even in imagination. I place a condensing lens in front of an electric light. Before this lens I put a screen with a circular opening, and before that again a lens which throws a circular disc on a sheet or screen. We have a clear, white disc of light, which we will call our sun. Now we will introduce an imitation atmosphere, in the shape of a glass trough containing a solution of hyposulphite of soda. The disc remains white and clear. A few drops of hydrochloric acid are placed in the solution, and soon they begin to re-act, and minute particles of sulphur begin to be held in suspension in the path of the beam. Note what follows: A pale yellow colour appears on our sun, then an orange tint succeeds, as the turbidity increases; next, with a still greater number of particles suspended, red sets in; and then the red gives way to darkness, for the increased turbidity prevents any light from passing. If, however, you look at the trough, you will see that, while no blue rays tinted the image on the screen, a halo of blue light which may be compared to the sky is scattered from the trough.

We should be able now to understand not only the colour of the sun when setting, but the gorgeous colouring of the sky and clouds which accompanies it. The colour of the sun may sometimes be different from the colouring of the sky. But the difference is entirely dependent on the scattering of light by particles suspended in the air. Let us take a common instance which shall illustrate all instances: We see a ruddy sun low down toward the horizon, and stretching far away, even to the zenith, are crimson clouds lying against a pea-green sky, which becomes orange as it falls into the west. The ruddy sun is easily explained by the experiment, for it shines through a density corresponding to many atmospheres. If we were a few thousand feet up, we should see the sun almost as bright as at midday, because there would not be so dense a path for its rays.

The crimson clouds are generally about a thousand feet above us, and will be illuminated by an orange tint. The rays, however, in order to reach us have to pass through a thousand feet of dense atmosphere. This cuts off the orange light, and leaves only the red to reach us. But in addition to being lighted up by the sunlight, the clouds are also illuminated by the blue light of the sky, and the feebler the intensity of the red is the bluer will be the light reflected to us, and,

therefore, we may get any shade from crimson to purple.

The pea-green appearance is due to contrast, for green is complementary to red, and the blue sky seen through the complementary colour takes on that peculiar bloom. The orange sky in the west is readily understood. When the sun approaches to within seven and one-half degrees of the horizon it shines through a density equivalent to eight atmospheres. At this point the violet, the blue and most of the green rays are cut off, leaving the yellow rays, which cause a yellow sky; as the sun sinks lower and the equivalent number of atmospheres become greater, the yellow rays begin to pass through orange into simple red.

It is not infrequent to see the summit of high mountains tipped with crimson soon after sunset. This is due to the fact that the sun has sunk so low that its rays traverse a density of atmosphere sufficient to cut off all rays but the red, and the red rays mingling with the blue light of the sky give us crimson effects.

The general absence of red effects at dawn is due to the lack of moisture in the atmosphere, for during the night there has not been so much evaporation as there is during the day. Should water-vapour particles be so abundant as to cause a red dawn, the atmosphere must be in a state approaching saturation, and soon there will be complete saturation. Hence we take a red dawn to be a prognostication of a downpour.

It will be seen that the mysterious glories of the sunset and the dawn are easily solved by the laws of refraction, coupled with the knowledge that the air holds in suspension myriads of particles. What magnificent effects result from little things!

THE death is announced of Mr. James Nield, of Oldham, a well-known Lancashire scientist. He was born at Oldham in 1825, and retained his connection with that district the whole of his life. He was apprenticed to a copperplate engraver, but eventually became a lithographic printer. Some twenty years ago he retired from business, so as to entirely devote himself to the scientific studies he had been engrossed in for some time. Mr. Nield became an accomplished geologist and botanist, and an authority on microscopical science.

THE Richmond Collotype Printing Co., Ltd., was registered on April 4th last, with a capital of £25,000 in £1 shares, "to enter into an agreement with J. & H. Pullman and H. Berghoff, and to acquire and turn to account the secret of and process for collotype printing."

THE Court of Chancery has sanctioned the reduction of the capital of Marcus Ward & Co., Ltd., from £200,000 to £120,000, and this reduction is to be effected by writing off £4 from each £10 share.

Catalogue Artists.

THE following extract from *Cassell's Saturday Journal* is quite refreshing, and artists may feel that some, at least, are still treated with that amount of consideration which their labours deserve, rather than as so many mechanical contrivances which can live on poor pay and still keep abreast of the times:—

"How many people, when looking over an elaborately illustrated catalogue, give a thought as to the artists who are responsible for the drawing of the different designs therein set forth?" remarked the principal of a large manufacturing firm to the writer. "Not many, I venture to say. And yet catalogue illustrating is an art, and a difficult one at that.

"A really good artist in this line has offers of more work than he can possibly find time to accomplish, and can command his own price. But he well earns his money, for the work he has to do is by no means easy.

"Take the catalogue and price list of a large Birmingham firm of metal workers. Of one article they manufacture there may be fifty varieties, each totally different in pattern. As a cut of each must appear in the catalogue, it may be imagined that the artist who makes the drawings has no easy job in reproducing faithfully the countless minute intricacies of the various designs.

"One manufacturer of my acquaintance issues a beautifully got-up catalogue twice a year; and I know for a fact that the artist he employs received last year a couple of cheques, amounting to the handsome sum of £150, for his services.

"A now prominent painter of the pre-Raphaelite school, noted for the faithfulness with which he delineates the minutest details in his pictures, was, in his early days, a catalogue artist; and he puts down much of his present success to the training he received in that little-known branch of art."

THE recent sale of many of the old wood blocks by Bewick, Cruikshank, and other past masters of the wood engraver's art, has doubtless caused much moralising amongst members of the old school. Many of these blocks were sold by auction, and are described as having fetched similar prices to that of decent firewood. Doubtless they have had their day, and, even if placed in the hands of good printers, would lose in comparison with the results obtainable by modern line and half-tone blocks. Naturally they cannot last for ever, and, shall we add, despite any possible charge of want of respect for ancient institutions, perhaps it is as well they should not.

A MACHINE has been invented that will paste labels on 100,000 cans in a day of ten hours. There is an endless procession of rolling cans on a shoot, and each can picks up a label as it passes.

American Art Posters.

INTEREST in artistic posters continues, and their appearance on bill boards increases, says the *American Bookmaker*. It cannot be said that all of these productions are unqualifiedly good from an artistic point of view, but many of them are decidedly striking and are calculated to arrest attention.

Lovell, Corywell & Co. have brought out a "Chimmie Fadden" poster which is amusingly suggestive and possesses considerable merit. A young man and woman walking along the street, encountering each other from opposite directions, their faces hidden behind copies of "Chimmie Fadden," are so absorbed in the delights of the sketches that they are in imminent danger of colliding. The figures are spirited and the idea of absorbed interest is well carried out, but for effective poster work it is too black and white, the only colour appearing in the waist and bonnet of the woman. Something is wrong with the young lady's book; the recto and verso have changed places, and she seems to be reading from right to left instead of from left to right, as is usual. Perhaps this is one of "Chimmie's" little jokes, or the determination, maybe, of the designer that there should be no doubt about what books the hurrying pair were reading.

The newspapers have gone into the poster business now. The *Sun* has brought out a very attractive one, which shews a tall, stately woman robed in trailing garments of crimson velvet, her cherry red hair bound with a fillet. This splendid creature is walking along a bright blue road, which leads up a gentle acclivity between well-kept lawns of blue-green grass, towards a number of brilliant blue trees, beyond which an orange coloured sun is about to rise above the hill tops into a canary coloured sky. All of this sounds somewhat crazy, but it is a strictly conventional and very effective design. The printers have succeeded in giving the woman's draperies a velvet texture which is quite wonderful.

The *Herald's* poster is more delicate and less startling in colour, being a *fin de siècle* Venus, in a big picture hat and primrose-yellow draperies of modern cut, floating easily in space, one hand reining in a capricious six-in-hand team of white doves, while with the other she offers the Easter *Herald* to the hurrying multitude.

The *World* poster is by Louis J. Rhead, and shews a little tendency toward the sweeping spirals and impossible draperies of the Bradley-Beardsley type. It is graceful, and shews no grotesque ideas nor indecorous suggestions.

A free exhibition of posters was held at the Pratt Institute, Brooklyn, during the last week in March, and it proved to be both interesting and instructive to the students in the art classes. A long list of French, English, and American artists was represented, among them J. Cheret, E. Grasset, H. de T. Lautrec, Paul Ballurian, Aubrey Beardsley, Mortimer Menpes, W. H. Bradley, George Wharton Edwards, Edward Penfield, Louis J. Rhead, and others. The exhibition was well attended, and the designs exhibited created much comment.

THE moral of the following verses from the *Evening Telegraph* is decidedly to "be up and doing." It is *so* easy to dream, and many of us are wonderfully prone to talk instead of practically carrying out laudable intentions:—

Paintin' Picters.

As I'm sittin' by the ingle,
In the gloamin' grey an' dim,
I'm a-dreamin' uv the future,
An' a-workin' with a vim;
For I'm goin' ter do a hustle,
An' ter make things hum a bit,
As I'm sittin' there a-dreamin',
Jest a-dreamin' as I sit.

An' I paint the purtiest picters
That a feller ever drew,
An' I wallop on the colours—
Every one uv gorgeous hue.
Then I reckon up the glory
That is bound ter come my way—
As I'm sittin' there a-dreamin'
At the dream-hour uv the day.

It's jest this way: Most uv fellers
Take ter wastin' uv their time,
An' they mostly fair enjoy it,
Though it doesn't earn a dime;
But 'times they'll get ter movin',
Jest ter make their dreams come true,
An' then there's use uv dreamin'
When the night goes blacker blue.

THE GABERLUNZIE.

THE art supplement presented with the *National Lithographer* (U.S.A.) is a photogravure from a painting by Alfred Dawson, entitled "A Sussex Lane." Mr. Dawson was born in Nottingham, and studied under his father, the late Henry Dawson. The sketch well depicts his favourite subjects of picturesque country lanes and cottages.

THE prize recently offered by a London weekly for a hand-written copy of its title-page was awarded to a Glasgow lithographic writer, Mr. Tilley. In making the award, the journal remarks that it never saw more beautifully executed caligraphy.

THE great ordnance survey map of England will be shortly issued. It has taken just twenty years to complete, and the total cost will, it is stated, exceed £4,000,000. The map will consist of some 180,000 odd sheets.

NEW YORK CITY has over 150 lithographic establishments.

EXAMPLES OF WORK DONE WITH MANDER BROTHERS

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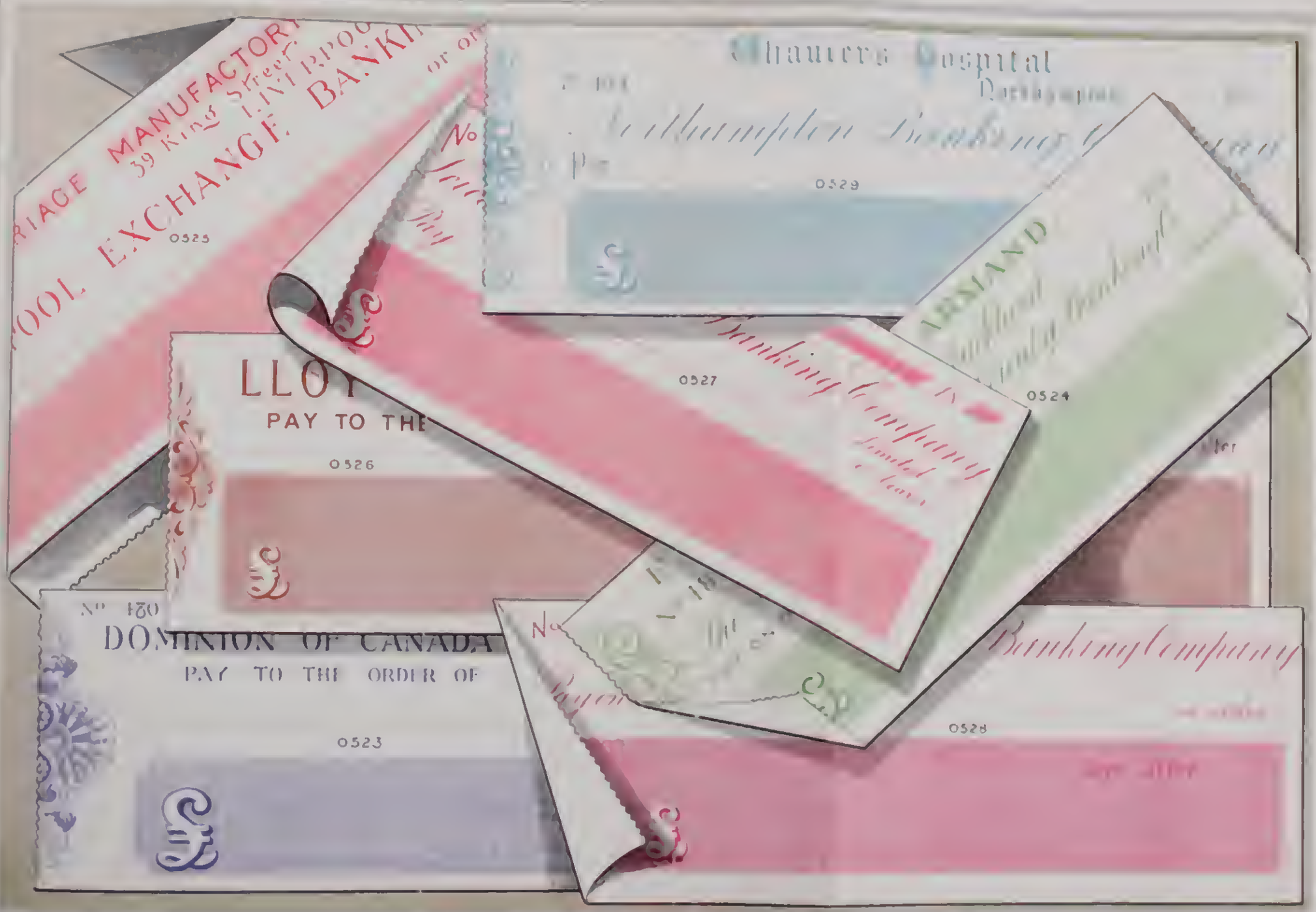

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BY CHARLES HARRAP.

CHAPTER XXI.

GRAINED STONES AND CHALK WORK.

CHALKED stone, as it is popularly called in the business, comprises the drawing of shaded work in lithographic black chalks, upon a previously grained lithographic stone, and so far as the general principles go, similar drawings upon grained zinc. Although not actually included in the term, yet, by inference, the printing from grained stone is part and parcel of the expression "chalked stone work," and it is that part of the process which will receive chief attention in this chapter. The preparation of the drawing is purely the work of well-trained artists, and as a rule the work thus drawn is executed somewhat more heavily than it is intended to print, thereby allowing for a certain loss of strength during the first and most important etch. As to the actual chalking, it is executed in a variety of ink and chalks. The ink, when used, is put on in thin washes. The chalks are of various degrees of hardness—the hardest being the copal, and decreasing in hardness through the different Nos. from 1 down to 8. The average degrees of softness for the chalks used are Nos. 1, 2 and 3; softer chalks than these will readily assist in filling in large areas of deep shades. In the ordinary acceptation, a chalk drawing is done with the sharpened or pointed chalk, supplemented by the use of thin washes of lithographic writing ink. But there are other cases—and they are very frequent—in which tints are put upon grained stones by a rubbing process, rather than by actual drawing. These tints are known as "rubbed tints," and can be obtained by the use of a hard ink specially prepared for the purpose, or by using the waste cuttings from the chalks. The hard ink is rubbed upon the grain, leaving a number of pieces of the ink upon the grain. These bits of ink are rubbed, by the use of a piece of washleather, or chamois leather, down into a fine flat tint. In a similar way, the cuttings of chalk are sprinkled upon the grained stone, and rubbed down into an even tint by the use of washleather upon the finger. These processes are practically the same as the stump processes of tinting, and the tinting may be done by the use of a stump, instead of washleather wrapped around the finger.

In any case, the elements of the whole process are the same. There is a grained stone, and a hard or soft soapy chalk worked into the surface to contend with, both of which are considerably different to the ordinary polished stone. These differences are not confined to two simple issues, and to demonstrate more clearly the whole range of diversity, the two classes of work can be thus compared.

COMPARISONS OF POLISHED AND GRAINED STONE WORK.

POLISHED STONE WORK.	GRAINED STONE WORK.
1. The stone is considered quite flat, having a high polish, and with only a moderately porous surface, which remains damp for a limited time.	1. The stone has a granulated surface, presenting points liable to tear paper, etc., placed on the surface, and, above all, holding a considerable amount of moisture.
2. The stone dries readily.	2. The stone remains damp for a long time.
3. The work is all on one plane, being upon the flat surface of the stone.	3. The work consists of innumerable broken fragments, deposited upon the points of the grain, on the sides of the grain, and down in the depths of the grain.
4. Damping the stone may be done with cloth, washleather or sponge.	4. Damping the stone must be done by a sponge or similar material.
5. The work, being on the surface, is more liable to be smashed by pressure in printing.	5. The work being massed so thickly together, and in the pits of the stone, is likely to fill up and become solid, rather than be smashed.
6. The ink used may be of any consistency and almost any quality, so long as due care is exercised.	6. The ink used must be of a good consistency and of a fair quality.
7. The ink used in making the drawings is hard, and not liable to dissolve readily upon the application of water.	7. The chalk used is soapy and always liable to dissolve when water is put on.
8. The work seldom requires to be etched before gumming up and rolling up.*	8. The chalk work must be carefully and well etched before it can be rolled up.
9. The work can be successfully rolled up with any ordinary make of roller.	9. The work requires that a nap roller be used to reach it.
10. In printing, any ordinary flat backing will serve.	10. The backing must include some soft firm material, such as a fine blanket.
11. The paper used in printing may be of almost any quality.	11. The paper must be of a good body, without surface or enamel.
12. In using ordinary polished stones, the coming up of old work is not very common.	12. In grained stone work the difficulty of old work coming up is of frequent occurrence.

Having pointed out the main features of the grained or chalked stone process, the details will now come with greater ease.

One of the greatest annoyances to an artist is to have a stone badly grained. The stone may

* The instances when ordinary ink work requires etching are, when the ink has been put on the stone in very thick masses, and when splashed tints have been introduced – such as air-brush and tooth-brush tints.

present some well grained surfaces and other portions with a very indifferent or flat grain. The graining of a stone to a fine granulation does not require a great expenditure of time upon any given surface. The time is utilised in having to grain large surfaces. The process of graining requires that a stone should be brought to a fairly well polished surface, the reason being that when a level surface is grained the stone will require graining equally all over. Having the polished surface, the stone is sprinkled with sand, the sand being sharp river sand, previously well washed, sieved, and dried. This sand is sifted upon the stone, the sieves used being of varying mesh, numbered from 40 to 120. The 120 sieve allows only the finest sand to fall upon the stone. When the sand has been sprinkled evenly on the stone, it is damped by sprinkling water upon it. Then a round edged stone muller is placed upon the sand, and the process of graining commences by bearing with a steady pressure upon the muller, and working it up and down the stone by short revolving movements. The action is slow and steady, keeping the pressure even, giving no one portion of the surface more graining than another. The stone muller grinds out the stone, which becomes a limy film, and is of little use for a continuation of the graining. This state should never be reached. The grainer should know by experience when the sand has ceased to bite. By working with a good crisp, fine sand, renewed at frequent intervals, a crisp short grain is produced. By using coarser sand, and renewing it frequently, a crisp and deeper grain is obtained. By using the sand too long, all the original crispness is lost, and a flat, useless grain is produced. It may be possible to convert a flat grain into a fine or coarse crisp grain, by renewing the sand frequently and not putting too much pressure on the muller. If, however, the grain is flat, and at the same time shews a lot of scratches in it, the only remedy is to polish the stone and commence again.

When a stone is partially grained, it is always advisable to go carefully over it with the rubbing-up rag, to see if any old work is likely to make its appearance during printing. After testing, the stone has to be thoroughly washed and the graining resumed. When the stone is said to be grained, the artist must go over various parts of it, chalking fine tints on it to prove that the grain is such as will suit the work, and to prove that the grain is the same all over the stone. Of course there are many cases in which it is preferable to have some parts of the stone grained very coarsely, and other parts finely. This can be easily manipulated by the grainer. After the artist has tested the grain, the chalk which he has put on must be grained out again. Finally, the stone must be thoroughly washed in hot water, which will materially assist it to dry quickly when placed in a heater, or before an open fire. The drying must be carefully done, and should be accomplished as quickly as possible to prevent any dust getting into the grain. When dry, it should be used at once, or covered with clean paper gummed at the edges. The artist next takes up the stone and completes the drawing, as already briefly described. When the printer receives the stone, the first care is to etch it. The methods of etching are various, and sometimes the artist prefers to etch his own work; but, at least the five following methods of etching may be mentioned, as practised successfully by different printers:—

1. A weak solution of nitric acid (HNO_3) and water is prepared, the chalked stone is inclined in a trough, and the acid solution poured all over the stone. The acid solution is drawn off from the trough, and again poured over the stone. This may be repeated, taking care not to pour the solution on the same part of the stone each time, until the proper amount of etching has been effected. That can only be gauged by experience. The advantage of this method is that as soon as the acid bites the stone, bubbles of gas are formed, and as the solution passes off the stone these bubbles are rapidly burst and carried away. If the bubbles do not escape readily, they form a barrier to the action of the acid, and many parts of the work only get partially etched. This method was adopted in the early days of lithography, and always gave excellent results.

2. A method of etching which is perhaps closely akin to the above, is carried out by arranging a water-tight trough upon a rocker. Into the trough the grained stone is placed. Then a weak solution of nitric acid (HNO_3) is put into the trough, so that as the trough is rocked, an even wave of the solution passes over the stone, and again leaves the stone exposed to the air. This method is simple and effective. It gives evenness of etching, and can be gauged very closely. It is certainly wasteful so far as concerns the amount of solution used. But the same object is obtained as in the first method.

3. The water-tight trough may be dispensed with, and the stone itself made to serve the purpose by gumming the edge, and, when dry, building a bulwark of engravers' wax all around the stone. The stone is set on a rocker, and the trough formed by the wax receives the quantity of acid and water. Then the stone is rocked, and the wave of etching solution etches the stone in the same way as in the two previous methods. This method has distinct disadvantages. There is the time lost in preparing the wax bulwarks, and, unless the stone is large and the work small, there will always be a portion of the acid solution lying upon the work and giving it extra etching.

In each of these methods the stone is finished by a wash of clean water and allowed to drain dry, then gummed up prior to proving.

4. The most common method at the present day is to prepare a solution of nitric acid, gum, and water in something like the following proportions:—

Water	1,000 parts
Nitric acid	12 to 14 parts
Gum	125 parts

This mixture is coated upon the work. The best method is to dip a flat brush in the mixture, and paint it on the stone evenly until it is all covered. Then it should be supplemented with a little more solution, and the process of painting over the surface continued gently so as to release the bubbles of gas as they form. In a similar way, such parts of the stone as are worked very heavily with the chalk can be gone over time after time with fresh supplies of the solution, and effectually etched to the necessary extent. When, by experience, the active etching is carried far enough, the solution may be left to dry upon the stone previous to proving. This method, although perhaps not so sharp as the previous ones, can be made most effective, as it allows of variations in the etching to suit the different parts, and it is at the same time so simple, not requiring any special trough or any special preparation of the stone. Its simplicity is its recommendation, and a good man can make it as effective as necessary.

5. The last method worth mentioning is only a difference in the material used. In the four methods above, nitric acid is the active agent, and has become recognised as the most suitable. But experience has also shewn that a strong infusion of tea, made by allowing the water to stand for a long time upon the leaves, has the same effect, the reason being that the tannic acid thus produced acts in the same way as the nitric acid. In using this solution, the method is the same as either of the three first processes described, and the results are eminently satisfactory.

So reads an advertisement in *The Magazine of Art* for April, 1895. We are aware of the admirable plant and skilful staff of the printing section of the Salvation Army, and no one admires the energy and enthusiasm displayed more than we do, but "must be a Salvationist" savours too much of merely conforming to an outward matter of form. This will do neither the cause nor the printing establishment any good. If the "Colonel" can secure a robust Salvationist competent for the position, well and good; if not, why not honestly obtain a Gentile in a businesslike fashion; for no amount of conforming to special principles will make him of further use either as a manager or as a Salvationist.

How the Pulse affects the Work of the Writer and Draughtsman.

DR. BERTILLON, to whose ingenious system of criminal identification references have been made in *Cassell's Saturday Journal*, has just made another and most important supplementary discovery in this direction. His investigations lead him to the conclusion that writing is influenced by the beating of the pulse, the intensity, strength, and speed of the pulsations all having a direct bearing upon the formation of letters.

The feeble heart-beat influences a colourless line in the writing, a letter without shading or variation in depth, while the gradations in strength, as indicated by the pulse, affect the writing in gradually stronger lines, until the vigorous, powerful pulse produces a heavy letter, not necessarily large, but determined and solid in appearance.

Dr. Bertillon further asserts that the pulse-beats in no two persons are the same, and, as each variety of pulse-beat creates a difference in the character of the handwriting, it stands to reason that the peculiarity of one's writing caused by the pulse will always prevail: the character of the beats will never change, and no other beats are similar. He has been experimenting with this theory for many years, and claims to have verified every detail. He has photographed miles of handwriting, enlarging the letters many times their natural size, and in this way has found the characteristics to be invariable.

Should these investigations stand the test of actual working, we may safely conclude that undiscovered forgery will become a thing of the past, nothing being easier in most cases than to obtain handwriting contemporary with the disputed documents or signatures, and to compare the characteristics revealed by this new method.

Writers and draughtsmen have doubtless frequently noted the influence of temperament and state of health on their work, and this theory will tend to explain the reason.

Backgrounds.

SHE sat before an easel, with her head tipped lightly so,
A paint brush in her fingers, idly trailing to and fro;
I stood quite close beside her, with a wildly beating heart,
And praised, with reckless ardour, her proficiency in art.

How sweet she was, and dainty! how I loved her, I declare!
It seemed to me no other girl could be one-half so fair,
As she sat there, leaning forward, in the gracefullest of poses,
And deftly put a background in a plaque of yellow roses.

Ah, that was many years ago; dear girl, I love her still;
I love her smiles and dimples, and admire the wondrous skill
Of her dainty snowy fingers—I've been watching them to-night
Move to and fro above the work she's been holding to the light—
And thinking of that other day, I doze a bit, perchance,
As she deftly puts a background into Jimmie's other "pants."

—*Judge.*

A New Zealand "Sketch" Story.

A CORRESPONDENT sends us particulars of an interesting case heard before the Bishop Auckland (N.Z.) County Court on May 7th last, and which recounts the old, old story of a sketch submitted by a lithographer, but not paid for. It is impossible to give the details here, though the whole story is instructive enough. In brief:—

Mr. Cummins, Eagle Printing Works, Bishop Auckland, sought to recover the sum of £5 for work done from the Marza Manufacturing Co., London. The first witness called on behalf of the plaintiff was J. W. Bergsen, of London, a traveller in the printing and stationery trade. In 1893 he was in the employ of Mr. Cummins, and in the course of his duties called upon the defendant company. In November, 1893, he called upon Mr. Deakin, who gave him an order for a sketch. Mr. Deakin detailed what he required, and it was to be a leaflet sketch advertising the defendant company's wines. Witness then got a proof from Mr. Cummins' works, and took it to Mr. Deakin, who made certain alterations. A second proof was prepared, and eventually Mr. Deakin was satisfied with it. Witness then asked Mr. Deakin the number of leaflets he required, and he replied that he would have to see a lithographic proof, as the number would depend upon the effect produced. Witness said the lithographic proof would be submitted as soon as Mr. Deakin stated the number he required, and added that this actually amounted to doing the work. He had executed other orders for the defendant company, the last quoted price being £18 15s. In respect of the order in dispute he forwarded the invoice in the usual way, but it was returned with a note to the effect that it should be held over. Since that time he had frequently written the defendant company asking the number of leaflets required, but many of the letters were ignored. Counsel asked if it was not a fact and a custom of the trade that when a proof is submitted it is at the risk of the printer, and that payment is only due in case of an order being given—eliciting the reply that in some cases it may be, but the case in question was especially different. It is sometimes customary to submit one sketch, but never two, and it is not customary to put that job upon the stone and submit a proof unless you are going to get an order. A director of the defendant company said it was submitted on the understanding that it would be at his own risk, and was asked by Judge Meynell: And you seriously mean to say that the printer must prepare you a sketch, that you must alter it, and that he must prepare you a new one, all for nothing? Well, no order, no payment. His Honour gave judgment for plaintiff for the full amount claimed, together with the costs of the London witness.

THE death of Mr. George Cargill Leighton removes from our midst the pioneer of colour printing as applied to illustrated journals. He was manager and publisher of the *Illustrated London News* for many years, and as far back as 1849 furnished reproductions of water colours by means of modifications of Savage's process, which was published in 1819-22. Mr. Leighton undertook colour printing by machinery in 1851, afterwards making use of aqua-tinted plates, and also of electrotyped silver and copper surfaces, with the object of obtaining both purity of colour and durability. The large coloured prints of the *Illustrated London News* were first issued in December, 1856. The *Amateur Photographer* also states that Mr. Leighton was a nephew by marriage of the great Sir Michael Faraday, and uncle to the celebrated artist, Mr. Blair Leighton.

THE current catalogue of nigh a hundred pages issued by Messrs. Ross & Co., the famous opticians of New Bond-street, London, W., is not only an admirably compiled and well-produced announcement of the goods provided by this firm, but is of much value as shewing the progress made in the production of scientific instruments and photographic appliances. Amongst the various articles detailed in its pages are the air brush, barometers, cameras, lenses, dark slides, microscopes, telescopes, and the general apparatus necessary for photographic and microscopic investigation. The ingenious "Photoscope" receives much attention, and in all instances the illustrations, descriptions, and price lists, no less than the general arrangement, are well calculated to assist research. Messrs. Ross & Co. have a world-wide reputation, and their catalogue explains somewhat of the lines in which it has been gained.

A COLLECTION of lithographed work forwarded by Mr. C. Palmer (Messrs. Wilsons & Horton, Auckland, N.Z.), shews the high class of chromo-litho production attained by our friends at the Antipodes. In a wide series of chromo-lithographed labels for fish, fruit, game, and general tinned stuffs, appropriate subjects are included in effective designs in which the lettering is a good feature. The drawing and colouring are admirably seconded by the careful printing. Various catalogue covers, notably one bearing a panel copied from a plank of the mottled Kauri pine, are striking and pleasing in effect. Mr. Palmer is evidently possessed of skill and practical application.

PREPARATIONS for the celebration in Paris of the centenary of the discovery of lithography are making great headway, and in August next an exhibition is to shew not only a history of the developments of lithography, but also the finest examples of work produced by the art in the collections of amateurs, and in the libraries of the Government.

City and Guilds Examination in Lithography.

THE examination of May 1st is over, and in glancing down the paper of questions, surely there is not much room to complain of the character of the questions. All the questions touch closely upon the common practice of a lithographic printer who has attended a technical school. In the twelve questions of the Ordinary Grade, No. 9 shews a want of thought in its construction. It may mean two things. The question may be read thus :—

"What difference would you make in proving a chalked transfer on polished stone and an ordinary ink drawing made direct on polished stone?" Or:

"What difference would you make in proving a chalk transfer on polished stone and a chalk drawing made direct on stone?"

There are now so many varieties of drawings and methods of treating them, that it behoves an examiner to be very careful in wording his questions to prevent mistakes. There is one thing certain, that the examiner scarcely meant putting shellac or rubber solution on the transfer or stone, although he used the word "proofing," which is apparently a misprint for "proving."

Question No. 12 is without its allotted number of marks. The questions 12 and 5 are certainly good in their bearing upon new systems which the printer should by this time be well acquainted with. The other questions are so closely allied to the trade, that the candidates would have the greatest difficulty in selecting which to answer best, for they should have been able to answer all well.

In the Honours Grade, question No. 3 is very awkward, as it seems to imply some print with which the examiner should also be acquainted to prove the statements in the answer. Question No. 5 is probably practical, but it fails to convey its real meaning. Otherwise the questions are first-rate practical issues, and should not fail to be well answered.

On the whole, the set of questions is a marked improvement in its definition between Ordinary and Honours Grades, and there is little doubt as to them giving general satisfaction to teachers and pupils alike.

Below is appended a full copy of the questions set :—

Ordinary Grade.

(*Nine* questions only to be answered.)

1. Describe the differences between transfer papers for the various uses of writing or drawing upon, transferring from stone to stone, and transferring from copperplate to stone. (35.)

2. Describe the differences between the inks for writing and drawing upon stone or paper, transferring from plate to stone, and transferring from stone to stone. (35.)

3. Point out the modifications you would employ in making up your ink for warm and cold weather, and give your reasons. (30.)

4. What, in your opinion, is the best method of preparing a stone, already printed from, which has to be laid aside for an indefinite time? (30.)

5. Describe any method you may know, or can suggest, of making transfers from stone with long keeping qualities. (35.)

6. Describe your method of setting a stone in machine to register with previously printed work. (25.)

7. Describe the methods of applying leaf metal to printed work. (25.)

8. What methods do you know of making up printing inks suitable for bronze and metal printing? (30.)

9. What variations would you make in "proofing" a chalk transfer and a drawing made direct on stone? (30.)

10. How would you proceed in rolling up and taking proof from an ink drawing on stone? (25.)

11. Describe the method of making litho. printing varnish. (25.)

12. Describe any mechanical methods you may know of facilitating the production of stipple effects.

Honours Grade.

(*Eight* questions only to be answered.)

1. Describe the qualities necessary in printing paper for good chromo work, and describe how such qualities are imparted to it. (30.)

2. Describe any bronzing machine you may be acquainted with, and the way in which it is best used. (35.)

3. Describe the order of printings and the reasons for adopting such order in any work of eight colours with which you are acquainted. (35.)

4. A drawing having been made to, and so marked, seven-eighths of an inch to a foot, and it is then photo-lithographed to a scale of four-sevenths of such drawing, what will then be the scale which should be written on such reduction? (30.)

5. Describe a method by which photographs can be utilised for drawing upon, and such drawings be subsequently reproduced by photo-lithography of the same or altered dimensions. (40.)

6. Shew how engraving on stone is accomplished, and describe the printing of the same. (30.)

7. Describe the process known variously as *phototypie, lichtdruck,* collotype, heliotype, etc. (35.)

8. Make a sketch of the lever and cam in a hand-press, and describe the working. (30.)

9. Make a sketch and describe the working of a stone-raising apparatus, and name the machine to which it is applied. (35.)

10. What is (roughly) the chemical nature and composition of the pigments known as Brunswick green, vermilion, Chinese blue, Indian red, ultramarine, and crimson-lake? (40.)

11. Describe some process of making half-tone engravings on copper by means of photography. (40.)

12. Describe processes of reversing black to white upon stone by photography and by manipulation upon stone only. (35.)

LOVERS of tastefully conceived and pleasingly produced pictorial subjects will delight in the splendid series of plates included in the monthly compilation known as "Sun and Shade." This artistic periodical is published by the New York Photogravure Company, price four dollars a year. The February, 1895, issue contains seven handsome plates, including a woodland scene reproduced in rich colours, a "living" picture, a marine view, a couple of landscapes, "Doin' Tollin'"—a charming child subject—and a capital representation of the Childs Monument at Stratford-on-Avon. The illustrations are splendidly reproduced, and form most welcome contributions to art portfolios. *Sun and Shade* may be obtained through our publishers.

A Proposed Paper Exchange.

THE subject of a central exchange at which business appertaining to the various branches of the allied printing trades could be conducted, has from time to time received attention in commercial circles. It is considered that the time is now ripe for the establishment of such a centre, and it is proposed to establish a company to be known as the Paper Exchange, Ltd. The prospectus says that "there can be no doubt that the important Paper, Stationery, and Allied Trades, whose annual transactions are represented by many millions of pounds sterling, will be vastly benefited by a central organisation, that will enable buyers and sellers to transact their business in a systematic manner, similar to that which has proved a necessity for every other trade of similar importance."

It is further stated that the Custom House returns for 1893 (the last annual statement published) abundantly prove the importance of the paper industry as regards imports and exports, shewing a total annual turnover of over £7,600,000.

(a) Imports into the United Kingdom during 1893 :—

Paper and pasteboards	£2,313,312
Papermaking materials	2,487,970
Stationery	166,094
	£4,967,376

(b) Exports from the United Kingdom :—

Paper	£1,474,280
Papermaking materials	361,542
Stationery	815,710
	£2,651,532

The above returns do not include any portion of the home trade, or of the varied branches of industry associated with the manufacture of paper and its allied trades, as—since the repeal of the paper duty—official figures are lacking for the actual complete turnover, there being no record available to indicate its enormous growth, its ramifications, and value. The annual value of paper and its constituents in Great Britain is estimated at about sixty millions sterling (£60,000,000), as appears from the following extract from the *World's Paper Trade Review*, of February 15th, 1895 :—

"The estimate of an expert places the annual value of paper and its constituents in Great Britain at sixty millions sterling. We should consider this as a low estimate of all the allied industries."

The promoters believe that the Paper Exchange, Ltd., will serve a three-fold purpose :—

1. To afford makers and consumers an opportunity to meet and discuss trading conditions, etc., and to effect contracts and orders.

2. To relieve the general market of all remnants, job lines, rejections, etc., and to concentrate these into one centre, and therefore under one control as regards sale ; with authorised agencies in the principal towns throughout the United Kingdom.

3. To grant advances on stocks.

To Collect—or not to Collect.

ANYONE who has ever suffered at any time from the mania for collecting, in any of its forms, says *Harper's Weekly*, must feel it in these days a constant tax upon his powers of self-restraint to keep his hands off the contemporary poster. The posters in particular with which some of the publishers announce the new numbers of magazines, and sometimes new books, are a constant temptation. Anyone who has ever collected anything must feel that they are too fascinating to be neglected, and that not to gather them as they appear is a neglect of opportunity that is almost criminal. For the solace of persons who have this impulse and refuse to yield to it, it is a pleasure to point out that, after all, the collector is a slave to his hobby, and the more things he collects the more masters he puts over himself. To be able to see pretty things and not to be bitten with the desire to take them home and salt them down, even when they can be had for the asking, is an attainment which promises to be quite as valuable for its rarity as most of the things that ordinary collectors acquire. When we see the awful lengths to which the postage stamp mania has gone, and the prodigious accumulations of photographs which overwhelm most contemporary families, we may surely justify ourselves in some stiffening of our resolution not to drift into the habit of hoarding even pretty things that we do not really want. It is so easy to begin collecting, and so unsatisfactory to stop after one has once started! Let us be stiff-necked—some of us, at least—and maintain that not to be a collector is a distinction, just as it is not to have had one's picture in the newspapers.

A WELL-KNOWN Parisian publisher, M. Mendel, is offering a prize of one thousand francs for the best series of photographs from nature, illustrating the text of either a fable, legend, or novel, by some well-known author. The competition closes September 15th next.

THE current number of THE BRITISH LITHOGRAPHER is bright, newsy, and full of life. We are pleased to find such an active journal attending to the interests of our trade across the "big pond." —*The National Lithographer.*

THE May *Scribner* contains a short article describing the origin and growth of the poster habit in France, with many illustrations of some of the best work of Chéret, Willette, and other masters of the art.

IT has been said that if a star
Were stricken from the dome of night,
A printing press, if stationed there,
Would fill the vacuum to a hair,
And shed abroad a brighter light.

What is Colour?

CHAPTER XV.—*continued.*

IN making a close comparison of the inks of various makers, it will be seen that the lemon-chromes differ somewhat.

The primrose-chromes of Manders and Winsor and Newton are similar, and are like the chrome-yellow (No. 1013) of Berger & Wirth. Horsell's primrose is deeper, and similar to Berger & Wirth's chrome-yellow No. 10.

The canary-chrome of Manders is similar to Berger & Wirth's chrome-yellow No. 4, and they are a shade deeper than the primrose.

B. Winstone & Sons' lemon-chrome is a full, rich yellow, very similar to the pale chrome of Winsor and Newton.

The lemon-chromes of Manders, F. Horsell, Winsor & Newton, are closely similar, and are represented by Winstone's pale chrome and Berger and Wirth's chrome-yellow No. 9.

The middle or gold chromes of Manders and Horsell are alike, and similar to Berger & Wirth's chrome-yellow No. 3. Winsor & Newton's middle chrome is deeper than these, and Winstone's is still deeper.

Berger & Wirth's chrome-yellows continue the above scale downwards by very small increases in depth, through their Nos. 8, chrome-yellow 408, 3, and 2, which resembles Winstone's middle chrome and Winsor & Newton's deep chrome. Then follows Winsor & Newton's deep chrome; then Winstone's deep chrome; followed by the orange-chrome of Winsor & Newton, which is a shade yellower than the orange-chrome of Winstone and chrome-yellow No. 6 of Berger & Wirth. The series of chrome-yellows being completed by Berger & Wirth's Nos. 6 and 7, which are practically pale reds, of deeper hue than Winsor and Newton's red-chrome.

CADMIUM YELLOW.—Next to the chrome-yellows cadmium is a most useful pigment. It is one of the series of permanent pigments whose chemical composition is a sulphide of the metal. It is found naturally as greenockite, and may be easily prepared by passing sulphuretted hydrogen (H_2S) through an acid solution of any salt of cadmium (say cadmium chloride). The cadmium sulphide (CdS) thus formed is the basis of the pigment. To test the purity of any sample, it can be treated with hydrochloric acid (HCl) or ammonium sulphide [$(NH_4)_2S$], neither of which dissolves it. Sulphides of arsenic, antimony and tin are soluble in $(NH_4)_2S$. When cadmium yellow is treated with liquid ammonia, it gives a white precipitate; and by increasing the ammonia the whole becomes soluble. If cadmium yellow (CdS) be used with lead pigments the sulphur is liable to blacken the whole of the lead.

As a pigment it is warm and brilliant. Some makers prepare it so that it is a brighter yellow than any chrome. Like the chromes it is opaque. It lends itself nicely to the formation of tints with zinc white, and it gives rich green with the blues.

Berger & Wirth's cadmium yellow No. 3 is a beautiful brilliant yellow, brighter than any of the following.

Manders' cadmium (No. 0752) is next in brilliance, being very similar to Berger & Wirth's cadmium yellow No. 2, and Winsor & Newton's pale cadmium.

Winsor & Newton's aurora yellow is not much unlike Berger & Wirth's No. 3.

Winsor & Newton's orient yellow is a deeper shade of aurora yellow, and is very similar to Winstone's pale cadmium.

Winstone's middle cadmium is a rich, full yellow of the depth of middle chrome, but richer in colour, and similar to Winsor & Newton's deep cadmium.

NAPLES YELLOW is prepared in different ways. Some manufacturers consider that its preparation by mixing cadmium yellow and flake white produces a satisfactory pigment, and it is probable that much of it is prepared in that way. But the genuine article is prepared by fusing at a moderate heat for about two hours a mixture of chemically pure antimonio-tartrate of potash, lead nitrate, and sodium chloride. When cool it is washed in cold water. The sodium chloride dissolves out and leaves the fine yellow powder. Commoner qualities may be made by mixing 3-lb. powdered antimony, 1-lb. zinc oxide, and 2-lb. red lead; then calcine, grind very fine, and fuse in a closed crucible; finally grind this fused mass very fine, and wash in water. Another method is to mix one part washed antimony with two parts red lead to form a stiff paste, which must be exposed to red heat from four to five hours. Finally pulverise and wash the powder. Each of these methods shews that, in the main, Naples yellow is a mixture of antimony and lead oxides.

It will be seen that in mixing this pigment it must be kept free from any other metals. Thus it cannot be used with iron, in case the oxygen should attack the iron, forming deep red mixtures, ultimately turning brown. Similarly the ink itself must be made up with an ivory, horn, or bone spatula on a stone slab.

Naples yellow, as a printing pigment, is a pale yellow, of a very opaque but permanent character; not of much value in printing, except where a pale opaque yellow is required instead of any bright full yellow of the chrome or cadmium series. The pigments containing iron which cannot be compounded with it are: the ochres, sienna, Indian red, Venetian red, Chinese blue, Prussian blue, or terra verte. As a very suitable substitute for Naples yellow, the mixtures of cadmium yellow and white, or Indian yellow and white, have been found very successful. Pure Naples yellow ground in oil ultimately shews a brown hue, after exposure to sunlight. Most makers prepare a Naples yellow. Berger & Wirth have three shades—No. 1 being dark, No. 2 being lighter, and "light" (No. 418) being very pale.

The colour cannot be considered a pure yellow. There is a strong trace of pink in it, which makes it a pale salmon or flesh colour.

RAW SIENNA. Of the ochres, perhaps raw sienna is one of the most useful. Its original name of terra di sienna shews it as an earth originally found near Sienna, in central Italy, and it is now imported from the province of Tuscany. The earth is a clay, and its peculiar colour is due to the presence of a hydrated oxide of iron.

Raw sienna, as a printing pigment, is a bright though impure yellow of a permanent nature, and above all it is transparent. Like most ochres or earths it is a fair drier, and requires but little addition of driers. It should always be softened by the use of a little Manders' pomade. Its permanent character makes it suitable for varnishing. If ever it is bought dry, it should only be in a fine state of pulverisation; the earth is so hard that it requires long grinding, and for every 100 parts will require some 75 parts varnish. If necessary to brighten it, to remove the brownish tinge, yellow lake may be mixed with it. This forms a good, bright, powerful yellow.

Raw sienna can be successfully made into tints with varnish or white. It may be used to produce green of a coarse appearance, and in general use it can safely be introduced into any bright or transparent pigment to give a yellow hue, without destroying either permanency or transparency. It can also be used as the colouring matter for a bronze ink.

The raw sienna printing inks manufactured are: Berger & Wirth's No. 223, a pale brownish yellow, looking more like a deep Naples yellow; Manders' No. 0758, a deeper shade, distinctly brownish; Winstone's, still deeper; Horsell's No. 816, a deep yellowish brown.

[To be continued.]

Manchester Technical School.

THE printing classes have again had the advantages and pleasures of visits to manufacturing and printing firms, as a finale to the long course of winter lessons. To the letterpress students all these visits are of interest and value, whilst to the lithographic students the two visits which are always looked forward to with considerable pleasure are to Messrs. Furnival & Co.'s works at Reddish, and to a paper mill. The first of these was held on Saturday, April 6th, and those who had the opportunity of taking part in it expressed their gratitude to the well-known printers' engineers for again throwing the works open, and shewing in every stage of construction lithographic, letterpress, and collotype machines, as well as the endless variety of presses, bookbinders' machines, and gas engines.

The second visit was made to the paper mill of Messrs. Chadwick & Taylor, situated on one of the docks of the Manchester Ship Canal, on Thursday, April 18th, at 7 p.m. This mill is large, and exceptionally well kept for the purposes of inspection. The recognised system of using cotton rags, straw, etc., in making the white newspapers has been entirely abandoned, and the Manchester daily and weekly papers are now printed upon a paper which is entirely made from wood. The wood is in two forms—a coarser mechanically prepared pulp board, and a finer chemically prepared pulp board—which are mechanically reduced to a light flocculent material; then by boiling, sizing, loading, etc., it is converted into the thin watery pulp from which the great rolls of paper ultimately develop. A large works such as this is of much greater interest, for it allows the opportunity of seeing the latest inventions in the various machines or engines for each separate process, and it illustrates still further how that machinery of an advanced type, as well as the fact that so little variety of material of pulp stuff is used, are tending to reduce manual labour to a minimum. One of the outcomes of this development is that this mill is able to stop work on Saturday and resume on Monday without any detriment to its trade. This is an advance in paper making which may be regarded as a boon to all employed.

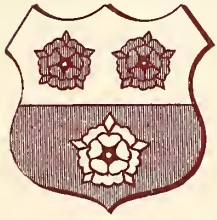
The other visit of the printing classes to Mr. J. Heywood's type foundry on April 26th, and the electrotyping on April 25th, received the full patronage and appreciation of the letterpress students; whilst both classes joined in the visit to the *Manchester Guardian* office on Saturday, April 20th, to see the methods of stereotyping and printing the evening paper.

There is no doubt the students of the Manchester Technical School have reason to be very thankful for the opportunities thus freely placed before them to widen their technical knowledge, and it should be an example to other large centres of education.

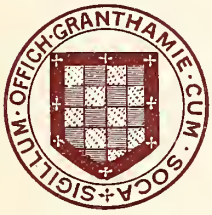
The Arms of the Towns and Counties of Great Britain.

Containing various points of note for the artist on the Art of Blazon.

Hampshire.



Grantham.



Hertfordshire.

Gateshead.

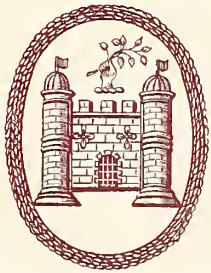
Lewes.

Helston Conwall.

Harwich.

Harrogate.

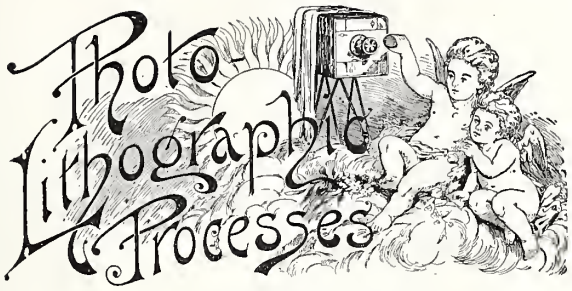
Knaresboro.'



Kent County.

Glasgow.

Huntingdonshire.



COLLOTYPE.

CHAPTER XXII.

COLLOTYPE FOR HALF-TONE LITHOGRAPHY.

THE fact that collotype printing is expensive, has necessarily led to attempts to utilise collotype as a middle process for the preparation of half-tone work upon stone. This process cannot be considered by any means a failure, and although the original expense in preparing the collotype may be taken into account, yet the resulting transfer upon stone is good, and it can be successfully worked as a lithograph. In that way a good print is obtained at a moderate expense.

In treating this subject so briefly in the present chapter, it is expected that the reader is fully acquainted with all the details of the previous chapters, and will turn back to the necessary references given, in order that the chapter shall not be overloaded with a mass of repetition.

Collotypes prepared with this in view are not obtained so well from the ordinary collotype films as from a modification of them. In chapter XII. the method of preparing the gelatine films was fully described, and for the present purpose the second recipe given in that chapter can be taken as a basis, with the following alterations. The ingredients should be :—

Creutz's middle hard gelatine	2 ozs.
Water	8 ,,
Bichromate of potassium	½ ,,

Prepare as already fully described in chapter XII., and to every 2½ ozs. of the jelly thus made add :—

Methylated spirit	2 ozs.
Ferricyanide of potassium (saturated solution)	10 drops.
Glycerine	2 ,,

These materials are prepared as follows :—The spirit is warmed by being placed in a vessel standing in hot water. The ferricyanide solution is stirred into the warm spirit, and the glycerine finally added. This spirit solution is kept warm, and is added very slowly to the warm gelatine solution, the latter being kept well stirred. All depends upon the way in which this solution is added to secure a clear gelatine solution. Methylated spirit it is well known coagulates albumen or gelatine, and to prevent this the mixture must be added with very great care.

It is understood that the glass is prepared in the same way as for collotype, and is surfaced with a substratum, as already described in chapter XI. These prepared plates are warmed in a collotype oven, and are ready to receive the modified film prepared as above. The gelatine solution must be thoroughly filtered through muslin, and kept warm during filtration by passing from one warm vessel to another. When filtered it should be poured upon the glass plate, through muslin tied around the neck or rim of the beaker or other vessel. A plate 15 × 12-in. will take about twelve fluid drams. The plate is then returned to the drying oven and dried at about 150° F. (66° C.)

The dried film is exposed under a reversed negative (see chapter XVIII.) The negative should be a good half-tone, not over dense ; and in "printing" it the edges of the film should be most carefully masked. After exposure, which must necessarily be sufficiently long to secure all the details, the plate is soaked in a solution of borax, then frequently washed in water until all traces of the unchanged bichromate of potassium are washed out. Then the plate is dried. In this condition the plate is in much the same state as an ordinary collotype plate before printing, but in actual printing it requires some slight deviation from collotype printing to obtain the proof and transfer. The plate is treated more like a lithographic stone than a collotype film, in the matter of rolling. The damping, however, requires that the plate should soak from three to five hours. When damping is complete, the plate must be well cleaned underneath, and rolled up with transfer ink on a nap roller. The film is finely grained, and presents the mechanical granulation of Maclure and Macdonald's chalk paper. This requires careful rolling up, similar to grained stones, fully described in the current articles on "Practical Lithography" (chapter XXI. *et seq.*) in this journal. The transfer itself must be pulled upon a full-bodied transfer paper, such as described under the title of "plate transfer paper" in chapter XIV. of "Practical Lithography."

A modification of this transfer paper is described in connection with the above process by Mr. W. T. Wilkinson. The recipe contains :—

Plaster of Paris	4 ozs.
Flour	3 ,,
Glue	¼ oz.

The plaster is mixed with water until it remains a creamy liquid and does not offer to set. This must be warmed before the flour paste is added. The glue is dissolved in ten ounces of water, and the flour is made into a paste with this water and glue. When well mixed, it is boiled into a thick paste, which is added to the plaster solution and well mixed. The mixture must be well filtered through

coarse muslin, and coated whilst warm upon a good paper. The paper may be coated twice, being allowed to dry between the coatings. When dried it is well rolled, or run through on a warm polished stone to give it an even face.

Upon such a paper the transfer may be pulled from the collotype film, and subsequently transferred to a well-polished stone. It may be necessary to slightly damp the transfer paper before taking the transfer.

When the transfer has been put down upon the stone, the paper only should be damped off, whilst the stone is put away until the next day before proving. In proving, it may be necessary to first etch the work before rolling up. That all depends upon the character of the transfer ink used, and an etch can scarcely be recommended. The work must be rolled up with all the care bestowed upon chalk-paper transfers, and the ink kept as stiff as the work will allow.

Examples of this class of printing, although not common, are certainly very good specimens of work, and the process in some form should become a successful method of producing cheap half-tone prints. The print in THE BRITISH LITHOGRAPHER, No. 22, opposite page 104, entitled an "Ink Photo," by Messrs. Sprague & Co., bears a strong resemblance to a half-tone collotype transfer to lithographic stone, or a transfer of a very similar character produced through the swelled gelatine process. Whichever way it was produced originally, the full supply was worked from stone, and shews clearly that work of this fine granulation can be worked in the lithographic machine from a polished stone.

Trade Papers Deserve their Success.

A MAN who subscribes for a trade paper does so, not only because he is alive to the interests of his trade in general, but because he expects to find in it—and generally does—information and suggestions of value in the conduct of his own business. Such a man reads his paper from end to end, advertisements and all, commenting as he goes along. Many things are jotted down on his memo. pad for every-day use, as well as for enquiring further into on his first visit to market. And as it is necessary for a man to be wide awake now-a-days in order to succeed in business, these are the men who subscribe to their trade journal, and are the advertisers' best patrons. They cannot afford to pass anything which promises help or suggests additional profits. Hence, the trade journal is the best medium for advertising things which concern the business man. —*Newspaperdom.*

THE latest addition to photographic literature is The Kodak News, a neat eight-pager, in which the Eastman Company effectively deal with their manufactures.

That Amateur!

THOSE of us who indulge in more or less successful attempts at obtaining photographic pictures should feel that our little games are being found out, and the methods we fondly hoped were ours and ours alone exposed to the ruthless scrutiny of the public, when we read what the *Detroit Free Press* has to say of the amateur photographer. This is how the offender is judged:

"Some day, when the punishment is fixed to fit the crime, the worst thing that can befall a criminal will not be death by electricity or hanging, or even by drawing or quartering. No; the most heinous of offenders will be punished by no such mild processes as these. He will be doomed to dwell under the same roof with an amateur photographer, and the worse the crime the more enthusiastic will be the amateur photographer, and the smaller will be the roof that covers them. It is only under conditions limited as to space that the amateur photographer rises to his full powers of diabolical annoyance. He is not a pleasing companion at any time, this amateur whose talk is all of plates and processes, whose fingers and clothes are fearfully, wonderfully, and chemically affected, and whose mind is all on one topic. But when he is at close range he is particularly and unspeakably awful. Every room in the house is turned into a dark room, should he so demand it, bath-rooms preferred, as having running water and being especially inconvenient for the rest of the household. Furniture and hangings are looked upon as merely so many scenic accessories. Many a time entrance is denied callers because the halls and drawing-room are in the act of being taken, and must not be disturbed or disarranged. That valuable utensil, the clothes-horse, is no longer available for laundry service. When draped with curtains, there's nothing like them for a background, says he of the camera. The worst and most humiliating time of all, however, is when the amateur photographer is seized with a passion for portraiture, and insists upon perpetuating the features of his unfortunate family in a manner as revolting to art as it is to vanity. He thinks nothing either of displaying these awful likenesses upon all occasions, his mind being concerned only with their technical instead of their personal aspect. Only the strongest ties of affection can render his presence at all supportable. He is simply an infliction and a torture. His true place in society is beside the thumb-screw, the gallows, or the whipping-post, where he would at least be of some practical service."

FIT your ad. to your business,
Like a good suit of clothes,
And 'twill meet with approval
Wherever it goes.

—*Printers' Ink.*

German Collotype Printers.

(Concluded.)

FRANKFORT-ON-THE-MAIN.

KÜHL & Co. run three steam and a number of hand presses, being chiefly devoted to trade catalogues. In 1886 the firm were appointed court printers to the Grand Duke of Hesse. They make a further speciality of micro-photography. Another Frankfort photographing and collotype house is C. F. Fay (1877), which employs sixteen persons and runs two steam and three hand presses, working both for trade and art. The house also does photo-lithography, and has its own factory for papers for technical purposes, especially tracing papers. It has an electric lighting and motor plant, and exports to England, Belgium, Holland, France, and Scandinavia. The Frankfurter Lichtdruckanstalt Wiesbaden & Co. (1887) also run steam presses, and works in autotype and photo-lithography.

Zedler & Vogel, of

DARMSTADT

(1888), employ eleven persons and three steam presses. Their speciality in collotype is views of towns and landscapes in glazed style. The firm also do photography, autotype, and zinc etching, publish a number of works, among them the "Klassische Bildermappe," and export to France. The court photographer and collotyper in

KEHL,

J. Kraemer (1872), has six assistants, and mostly does book illustrations to order.

KARLSRUHE

has several good collotype printers. J. Baeckmann (1875) is the court collotyper, and has received a number of awards. His work is architectural, plastic and industrial art subjects, landscapes, etc. J. Schober (1875), also a court collotyper, works for art publishers. The firm employs ten workmen, two steam and two hand presses, and has received fourteen medals and the orders of the Zähringer Lion and the Swedish Wasa. The house is further devoted to photo-lithography, and exports to Switzerland, Austria, Holland, Scandinavia, Belgium, and Italy. A. Hemberger (1877) employs hand presses for all kinds of mat and glazed collotype.

PFORZHEIM

boasts of three collotype printers. The oldest house, that of C. Koch, lately passed into the hands of Chr. Sailer, who keeps ten persons and three machines employed in turning out maps, plans, etc. Karl Winter, jun. (1890), is a collotyper and photo-lithographer, doing pattern books, advertising articles, and views. He has eight workmen, one steam press and three hand presses. He also exports to various countries. M. Ruoff (1891) has six hands and three steam presses occupied in producing illustrations for bookwork, catalogues, views, and albums. He has also foreign customers.

In addition to the collotype offices already mentioned in Stuttgart, the kingdom of Wurtemberg has some collotype printers in Esslingen and Schwäb. Gmünd. Carl Liebhardt, of

ESSLINGEN,

devotes himself to letterpress printing, photo-lithography, zincography, and autotypy, having fourteen assistants, three steam and six hand presses. He does all branches of work, and exports to America and Russia. W. Boppel, of

SCHWÄB. GMÜND,

is a photographer and collotyper with one steam and two hand presses, producing trade designs, catalogues, and landscapes, and doing a good trade with Switzerland, Italy, and America. C. Jaeger, of Schwäb Gmünd (1881), has four workmen and four hand presses, producing architectural drawings, landscapes, trade, and other work. He does some publishing on his own account, principally for technical schools, and exports to Russia and Holland.

Besides Munich, whose importance and principal houses have already been mentioned, there are numerous other Bavarian collotype printers, first of all in

NUREMBERG.

The most important house there in the printing line, E. Nister (1876), has only taken up collotype for three years, and works at present with one steam and one hand press, but arrangements are being made to greatly extend the branch shortly. The principal business of the house is in lithography, with departments for photography, zincography, autotypy, etching, heliogravure, wood engraving, lithographic printing, letterpress printing, stereotyping, electrotyping, and copperplate printing. The staff amounts to some six hundred persons. A considerable trade is done with England and America. Wilh. Biede (1875) does work in collotype, photography, photo-lithography, lithography, and wood transfers for wood engravers. The house employs eighteen persons, with one steam and two hand presses, and received the silver medal at the Frankfort Exhibition in 1892. It also publishes views of Nuremberg, portraits of celebrated Nuremberg masters, sketches by Adam Klein, and the like. Alfred Obhof (1889) has a collotype office and a photographic studio, and works principally for local customers. Jos. Einberger (1884) does collotype, photography, and photo-lithography, has three hand presses, and furnishes illustrations for pattern books, books, price lists, and so on, and exports to France and Holland.

Eug. Peterson, of

FÜRTH

(1882), has both steam and hand presses, mostly occupied in producing pattern books, albums of views, letter paper with views and portraits. He

also publishes a number of views. Alphons Adolph, of

PASSAU,

turns out postcards and letter paper with views, his establishment being at the same time specially adapted for photographic enlargements. Dr. Franz Paul Datterer, of

FREISING,

has a collotype department as well as others for letterpress and litho printing, chromo-lithography, autotypy and stereotyping, and bookbinding. The collotype branch is engaged in reproductions of landscapes, views of factories, machinery, engravings, pictures, pastel paintings, and so on, both for the firm's own account and to order. The house will next year celebrate the 400th anniversary of its establishment. The house of Jos. Kosel, of

KEMPTEN,

is even older, dating from 1593. The collotype department employs ten persons, with two steam presses of the well-known printing press manufacturers, Albert & Co., Frankenthal. The work done is chiefly coloured collotype. The department works principally for the firm's own account, and is supported by good departments for letterpress printing, zincography, autotypy, lithography, chromo-lithography, and photo-lithography and photography. Among the publications of the firm are the medical works of the celebrated Pastor Kneipp, which have been translated into all languages. In conclusion we may mention the institute for practically teaching photography and photo-mechanical processes established by the court photographer, W. Cronenberg, at

SCHLOSS GRÖNENBACH,

in the Bavarian Allgäu (1855). The school possesses an average attendance of fifty students, and in addition to photography, teaches all photo-mechanical processes of every kind, such as zincography in line and half-tone, photogravure, heliotype, etc.

AN INTERIOR VIEW.—The most screamingly funny of Bill Nye's stories is about a dog he once had, named "Entomologist," and his voracious appetite. This dog came to an untimely end by eating up a lot of plaster-of-Paris images he found at a street corner, which he mistook for blanc-mange. He died the same night, in spite of every attention from his master, who preserves a memento of him on his writing table in the shape of a paper-weight, which bears the inscription: "Entomologist, view of his interior, taken by himself."

RAFFAËLLI, the French artist, whose pictures were exhibited in New York with Mr. Abbey's, contributes a short paper to the May *Scribner* on the French "Impressionists," of which school he is one of the founders.

Etchings for Famous Pictures.

THOUGH scarcely in a technical fashion, our friend *Answers* concisely sums up some of the details connected with etching reproductions of famous pictures. The labour involved is fittingly emphasised; and as the method is much different to that in vogue for the reproduction of work in colours, non-technical readers may appreciate it. It has often puzzled people to know how such marvellously exact replicas of great pictures can be produced in black and white, and the writer proposes to give a very brief description of the system adopted by Mr. Robert Macbeth, A.R.A., the well-known etcher.

Should the canvas be a large one, it is, of course, necessary to reproduce it very much smaller, yet exactly to scale. In the first place, the picture is taken from its frame, and laid upon a table. Pins are then stuck all round the edge, half an inch or so apart, where, technically speaking, the subject is thickest, and three inches apart where the canvas is free from minute detail.

Threads of cotton are then placed across and downwards, so as to form squares, and each square is carefully measured. A sheet of paper the size of the plate required is then ruled in squares correspondingly reduced, and a careful drawing made of the respective contents of each square.

The copper plate is then covered with transparent wax, upon which the pencil drawing is pressed, with the result that a faint, but absolutely correct outline remains. The etcher then takes his needle and commences to scratch this outline on the copper through the wax, subsequently burning it in with repeated applications of nitrous acid (nitric acid is used on steel plates).

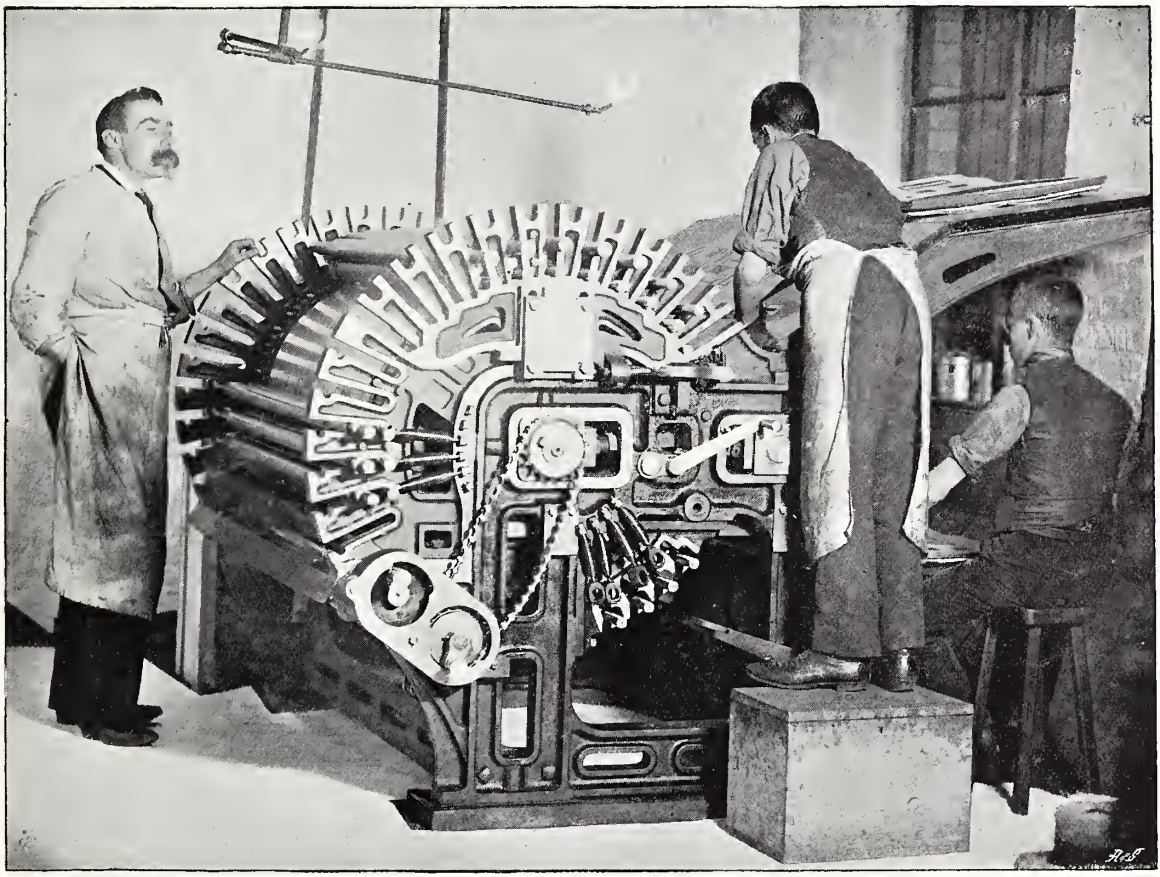
Such infinite pains have to be taken in first-rate work of this description, that Mr. Macbeth was once engaged nearly twelve months on a plate measuring twelve inches by four. He has, however, frequently been paid 1,500 guineas for etching a single picture.

"THE feelings and passions of a nation must be expressed in its art"—so said a speaker at the unveiling of the new panels at St. George's Hall, Liverpool. If this be true, it would be very interesting to know how the intelligent foreigner determines the feeling of the nation after setting foot on our tight little island. Was ever art so various?

WE are told that some firms in America spend annually great sums on pictures outside cigarette packets. One firm paid out £80,000 to the lithographers in a single recent year for artistic work. Another spent £90,000, while other firms reported payments of £75,000, £70,000, and £60,000 for the same purpose.

The Rotary Zincographic Printing Machine.

We have much pleasure in calling attention to a machine which will, when in general use, make a revolution in the lithographic printing trade, and also greatly facilitate and reduce the cost of certain classes of letter-press work. We refer to the rotary zincographic machine invented by Mr. Ruddiman Johnston, the



many advantages of which, when enumerated, will be evident to any practical printer.

We all know how conservative the British printer is, but when such a large proportion of the best work is now done abroad, as is also a good deal of the medium, and even some of the cheapest black work, it is evident that with the reduction that is constantly taking place in the cost of carriage the trade must eventually leave the country, if some effort is not made to retain it. The foreigner uses zinc largely, and when its many advantages are admitted, can any printer afford to neglect it? Instead of doing so, would it not be much better to encourage printers to use it, and so not only hold our own against foreign competition, but recover the position we formerly held?

Our illustration gives a general idea of the appearance of the machine, which occupies only about one-third of the space of an ordinary machine, and which is of the simplest construction, and therefore not liable to get out of order.

There are two cylinders—the larger of which carries the zinc plate, and has also parts of its surface devoted to the inking table and damping board—and the smaller which is the impression cylinder. The larger cylinder revolves at a uniform speed in one direction, and the smaller remains at rest to allow a sheet of paper to be fed into its gripper when the inking table and damping board are passing, then gradually gears with the larger,

permitting the sheet of paper to come against the plate to receive its impression, and as gradually comes to rest to allow the printed sheet to be removed, and a fresh sheet supplied. It will thus be seen that there is no heavy bed with its heavy stone to drive backwards and forwards, and pull up twice for every impression, with consequent racking to the machine and loss of speed, as in the ordinary litho machine, but a steady uniform movement which thus permits the machine to print as quickly as it can be fed. So steady is the movement that many printers would think that the machine was running at 700 an hour when it was really running at 1,500; but even this 1,500 will shortly be exceeded, for a later patent of Mr. Ruddiman Johnston's, to facilitate feeding, will permit of at least 2,000 impressions an hour being taken. With the ordinary lithographic machine one-half this speed cannot be maintained with safety; so when the enormous output this new machine is capable of is fully recognised, the British printer will admit the claim made for it, that when it comes into general use it will cause great changes in the lithographic printing trade.

There is again no time lost in

SETTING A PLATE,

though this is a tedious process with the ordinary machine. The position of the front-lay being marked on the cylinder, the margin required is marked on the plate, so all the machineman has to do is to place the one mark in a line with the other, and of course no levelling is at any time required. But should the work not be then in register, the plate can, by a simple arrangement, be moved in either direction, or diagonally, and there fixed—though even this is seldom necessary, as the front-lay itself is also adjustable.

Other points we may mention which will appeal to the practical printer. The front-lay is separate from the gripper, and is always up, excepting only at the line where the cylinders meet. The sheet is therefore never displaced on the feeding board after feeding, and as the grippers come straight down and do not touch the sheet until they hold it, they are unable to either push it up the feeding board or drag it down. The impression, again, is most solid, the printing taking place when the sheet is between the meeting lines of the two cylinders. The

INKING IS ADMIRABLE IN EVERY WAY,

the distribution being perfect, and though there is room for eleven inking rollers, we have examined some sheets with heavy flat tints printed in one rolling, with six inkers only in use, that are faultless. By pulling out or pushing in a little handle the ink supply can be instantaneously started or stopped, and a similar arrangement controls the supply of water to the damping board, the amount delivered being also controlled to a nicety. The inking rollers run on the plate and ink table, on the latter only, or off altogether, as desired; and the impression cylinder can be "struck off," or the machine itself can be stopped, instantaneously.

A new blanket can be at once fitted with equal tension all over to the cylinder, and rods with ratchet wheels are provided at each end of the printing surface, so that with a surplus rolled on the terminal end it is possible as the blanket wears at the gripper edge to keep replacing it there, thus allowing the blanket to last a very long time. Shorter or narrower plates than the full size can be used, and when a plate larger than the design is being printed from, the inking rollers are not deadened by being made to run on the extra portion.

ALL CLASSES OF WORK

can be done in this machine, and we have examined commercial work in seven printings, plate and type transfer work, writings and chalk drawings, and all are admirable, the specimens of work from plain zinc leaving nothing to be desired. For

LONG RUNS

no lithographic machine can possibly compete with this one, when it is further recognised that the more quickly zinc is printed from the better the impressions are, and that there is no limit to the size the machine may be made by using larger sheets; the printer may turn out more work in a day than he at present can in a week with the ordinary machine. Large posters can be printed in it in one sheet, so doing away with the ugly joins at present so noticeable, and we can quite imagine that any house having a large machine and making a speciality of this work, would obtain orders from users of posters who know how ineffective from bad joining their costly advertisements appear on the walls. Many classes of

LETTERPRESS WORK

could again be printed much more expeditiously on this machine, for a number of transfers could be pulled, transferred, and the plate be in the machine in a tithe of the time required for stereotyping. Then no making ready is necessary—no underlays or overlays—any size of sheet can be taken and printed from much more quickly than by the "Wharfedale," and as the cost of the plate is so trifling, it can be retained for future editions.

For special orders, or second editions, the advantages of using zinc have only to be mentioned to be accepted. No redrawing or transferring is necessary, for as the plates cost so little the work can be retained, even including all the colour stones, at a nominal cost. In fact, the thinnest zinc only costs sixpence for a 32 × 42-in. sheet, and this can in a few minutes be grained with acid. In the future such plates will be used, and all work retained on them, new work being produced on new plates; for it will be cheaper to do so, and melt down the plates with work on them which is

not further required, than go to the expense of cleaning it off and regraining. In fact, it is possible that the stone polisher, with all his paraphernalia, will in time be things of the past, and that a stock of thin plates will be kept as a stock of transfer paper on a shelf is now, and that the transferrer will simply take a sheet when he requires it, the existing transferring press answering without any alteration for the preparation of work for the machine now being described, as the zinc plate used in it has no turned-down edges, and thus can be laid on a stone during transferring.

Lithographers and all interested in the craft—particularly in these days of keen competition with other methods—will learn of this machine with the liveliest interest, and to anticipate enquiries, it may be added that close examination of work produced from the plates on this rotary are satisfactory in every respect. The specimens include labels in one and more colours, wine advertisements in colours and gold, and some very effective maps—all worked from plain zinc. We commend close attention to this departure, and would refer readers to the trade announcement on another page of this issue.

Litho-Photogravure.

A SHORT time ago Herr Ottomar Volckmer, president of the Vienna Photographic Society, published a very interesting description of a peculiar and very perfect photo-mechanical process, invented by a friend of his, Carl Eckstein, of the Hague. The following is his description of the process :—

A lithographic stone of the finest quality is polished with oxalic acid and water, and then covered very evenly (by means of a roller) with a diluted asphaltum solution, which is prepared by boiling 5 parts of asphaltum, 6 parts of white wax, 6 parts of stearine, adding to it 2 parts of soda solution, dissolving the whole, after cooking, in turpentine oil. The solution should be filtered and kept in well-stoppered bottles. Into the thin, light-brownish film are now (by means of a diamond, with the ruling machine) scratched very fine lines, from 8 to 10 per millimetre (1-26th of an inch), until the stone is evenly covered with them all over. The stone is then provided with a wax border, 1-5th of an inch high, and well levelled within a trough. An etching fluid, consisting of 1 part of pure nitric acid, 36 parts of alcohol of 36°, and 2,100 parts of distilled water is now poured over the stone. After half a minute the stone is quickly washed, dried, and oiled, and the asphaltum washed off with turpentine. The stone is then inked up, and forms the so-called "mother stone," which is then ready for providing transfers. Now, one or a number of transfers are made from it on a well-polished stone, which is afterwards re-polished with oxalic acid.

The transfers are put down on stone by slightly moistening the back of the print on the transfer paper, squeegeeing it on to the stone, and, when almost dry, by treating it with warm water until the paper comes off. After well washing the stone with warm water, other transfers can be applied to it, so that the lines cross the former ones from one to four times. The latter is especially to be recommended for litho-photogravure work. The stone is then dusted with finest resin powder, the surplus removed by means of a camel-hair brush, and that adhering to the lines is melted on to the transfer by ether vapour. A carbon transparency on glass is now produced from a good, clear negative, and from this positive a negative print is made upon ordinary pigment paper. This negative print is moistened, squeegeed on to the ruled stone, and developed with water of 104° to 113° F., until the paper, and afterwards the excessive colour, begins to loosen. The stone must be constantly rocked in warm water during development. The stone now bears a negative carbon print. The stone should then be dried spontaneously, which requires from five to six hours. The etching is done with ferric chloride of 40°, 37°, 33°, and 30° (Beaumé) respectively, beginning with 40° and finishing with 30°. This requires skill and practice. The strong solution etches first through the thinnest parts of the relief, after some time also through the thicker ones. The etching fluid of 30° dissolves at last in its water the whole of the pigment film still remaining. As soon as the required depth of etching is attained, the stone is removed to a trough and thoroughly washed in running water; then the asphaltum is washed off with turpentine, washed again in several changes of water, and dried. The image is now deeply etched in the stone. Finally, it is oiled, inked up, and treated otherwise as any other engraved stone. Should it be desired to print from the stone in more than one colour, it is first inked up with a local tone—grey, violet, or brown—according to the required character of the picture, and then by marking out the other parts. The single colours are imposed upon the ground tone. A very slight touch will deposit a sufficient amount of colour. As soon as the different colours have been applied, a print can be made at one pull. The colour effect is said to be excellent.—*Photogram.*

AN exhibition of matters connected with photography and the allied industries will be held at the Royal Aquarium during June, and many well-known firms have arranged to take part. To exhibitors the charge for space will be one shilling per square foot, and sales will be permitted. Tickets equivalent in value to the amount paid for space will be given to each exhibitor. Medals and diplomas will be awarded to the trade section and for photographic competitions.

General Trade Report.

THE slight decline in the trade which was noticed in our last issue has unfortunately been confirmed by the statistics for March and April. The trade is undoubtedly only in a moderate condition at present, and is not quite so flourishing as at the same period last year, as the following tabulation of the percentage of unemployed will shew :—

	Feb.	March	April
1894	5·8	4·2	5·0
1895	4·8	4·9	5·4

These figures, however, compare favourably with those shewn by trade societies in general, 84 of whom make returns for their 386,627 members, and shew that 25,174, or 6·5 per cent., are unemployed. The state of trade seems to have taken opposite courses, for when in February there were 30,624 unemployed, the printing and kindred trades were not badly employed, whilst now, with 5,000 odd less unemployed, our trades shew a decline.

In a recent speech the Chancellor of the Exchequer looked with a hopeful eye to a slight recovery of trade in the near future. Whether that is so or not, any increase in trade will be greeted with pleasure, and will appear by comparison as a distinct advance upon what has just gone. In our own trades we cannot expect much change for the better, as the time of the year does not warrant it.

The following brief details will shew how the trade is at present in all the large centres of our business :—

ABERDEEN.—Letterpress 9 per cent. and lithographers 9·3 per cent. unemployed. Bookbinding good.
ACCRINGTON.—The trade maintains a steady state.
BARROW.—Printing trade only moderate.
BATH.—Very little improvement on the past dulness.
BELFAST.—Printing trades all improving; 5·2 per cent. unemployed. All branches fairly busy.
BIRMINGHAM.—The printing trade is, as usual, just moderately employed.
BOLTON.—The trade is moderately busy.
BRADFORD.—Printing trade moderate.
BRISTOL.—Printing trade, 2·4 per cent. unemployed; bookbinding being quiet.
CARDIFF.—Letterpress bad. Lithography, as usual, fair.
CARLISLE.—Lithography is still fairly good.
CORK.—The whole trade is exceptionally busy.
DERBY.—Lithography bad, with 8 per cent. unemployed. Letterpress slack, with 5 per cent. unemployed. Bookbinding fair.
DUBLIN.—Printing trades, 18·9 per cent. unemployed. Letterpress and lithography very bad. Bookbinding good.
DUNDEE.—Letterpress good. Lithography moderate. Bookbinding quiet.
EDINBURGH.—Letterpress only very moderate. Lithography good.
GLASGOW.—Letterpress, with 7 per cent. unemployed. Lithography good. Bookbinding quiet.
HANLEY.—Letterpress bad, with 10 per cent. unemployed. Lithography and bookbinding fair.
HULL.—Letterpress improved. 4 per cent. unemployed. Lithography fair.
IPSWICH.—Letterpress improving.
LEEDS.—Letterpress slack. Lithography moderate.
LEICESTER.—Printing trade very fair.
LIVERPOOL.—The whole trade is in a fair state.
MANCHESTER.—Letterpress bad, with 8·2 per cent. unemployed. Lithography moderate.
MIDDLESBORO', ETC.—Printing trade fairly employed; only few unemployed.
NEWCASTLE.—All branches maintain a good average of employment.
NORWICH.—Letterpress dull. Lithography fair.
NOTTINGHAM.—Letterpress bad. Lithography only moderate, with 4·5 per cent. of printers and 5 per cent. of artists unemployed. Bookbinding fair.
OLDHAM.—The printing trade is not suffering from much depression.
PLYMOUTH.—The branches of the trade all report trade as fair.
SHEFFIELD.—Letterpress, 8 per cent., and lithographers, 5 per cent. unemployed. Bookbinding good.
WOLVERHAMPTON.—Letterpress fair, with 3·6 per cent. unemployed. Lithography fair.

The state of trade, as gauged by pauperism, shews some improvement, as in April there were 343,688 individuals nearly every day receiving relief, as compared with 406,381 in February. Trade has not recovered to the position of 1894, as will be seen by the fact that imports are still 2 per cent. less than in April, 1894, and exports 1·8 per cent. less. On the whole, there is a lot to be made up before trade can be looked upon with any degree of satisfaction.

EDINBURGH.

TRADE here is very good at present, there being no members of the Society on the unemployed list. The technical class finished for the session on the 7th May, when the prizes and certificates were distributed as follows :—

JOURNEYMEN.

J. Gordon	1st Prize and Certificate.
Wm. Cathie	2nd ,, ,,
John Steel	3rd ,, ,,
D. Wallace	Certificate.

APPRENTICES.

David Wallace	Equal. 1st Prize and Certificate.
Chas. Cousland	
Wm. Henderson ..	
J. Bishop	2nd Prize and Certificate.
J. Hay	3rd ,,

Essay on Lithography, open to journeymen and apprentices :—

Chas. Cousland	1st Prize (apprentice).
"Marmion"	2nd ,,
— Smith	3rd ,, (apprentice).
D. Gorrie	4th ,, (journeyman).

ON Tuesday evening, April 23rd, a number of lithographers, along with the machine class of the Edinburgh Typographia, paid a visit to Messrs. Fleming's Ink Works, Granton, and were shewn the various departments of ink making. The party, numbering fifty, were also entertained to tea in the offices by Mr. Harris.

The International Exhibition of Lithography.

THE exhibition to be held in Paris in celebration of the Centenary of Lithography, was mentioned in a previous issue of the B.L., and since then definite steps have been taken with the intention of making the occasion a fitting one. Special endeavours are being made to obtain specimens from lithographic centres in the British Isles, so as to achieve a result which shall be thoroughly representative, educational, and historical. The various sections are as follows:—(1) History of Lithography; (2) Artistic Lithography; (3) Scientific Lithography; (4) Industrial Lithography; (5) Lithographic Materials; (6) Industries connected with Lithography. The exhibition is announced to open on the 15th August next, and remain open until the end of November.

Our friends across the Straits have every facility for making the occasion a noteworthy one, and they may be expected to collate a collection of much value and of the greatest interest. The standard of lithography obtained in France proves that the art was easily adaptable to French tastes and skill, and it is fitting that the Centenary should thus receive recognition.

MANY visitors have been interested in Messrs. Cassell's exhibit of black and white at the Cutler's Hall, and all who appreciate good drawings have doubtless derived much satisfaction from an examination of the temporary contents of the fine hall. The sketches include drawings by Herbert Railton, Alfred East, R.I., J. Fulleylove, R.I., J. Fullwood, R.B.A., Gordon Browne, R.B.A., Holland Tringham, C. W. Wyllie, W. L. Wyllie, A.R.A., W. B. Woblen, R.I., Louis Wain, G. Clausen, J. Macwhirter, R.A., Sidney Paget, W. Paget, F. Pegram, J. Pennell, C. Ricketts, R. C. Caton Woodville, Sir J. D. Linton, and many other more or less well-known black and white artists. The exhibition, as a whole, presents the work of our modern illustrators in most interesting form, and is further valuable as shewing the nature of the pictorial embellishments of current magazine and book work.

THE application of dilute ammonia to any matter printed with ordinary printer's ink will soften it so that a transfer may be made on stone, but better results can be obtained by photography.

IT is pleasant to learn that British craftsmen can now more than hold their own with the Italians in mosaic work. Prof. W. B. Richmond, A.R.A., well known in connection with the decorative work in St. Paul's Cathedral, has stated that the English workmen now employed there are producing some of the finest mosaics in Europe. It is only of recent years that the Italian workmen have been seriously rivalled, but it is nevertheless gratifying to note that eventually they have been compelled to take second place.

"POSTER WORK," said a popular artist the other day, "is far more profitable than painting for the exhibitions. You may paint good pictures by the yard, and send them to the different picture shows, and then find that they won't sell. But if you take to drawing posters in the rough-and-ready, yet artistic style, now popular, you may make a good income." *Verb. sap.*

NOONTIDE AT GRÄTZ.

Half-tone Block by C. Angerer & Göschl, Vienna.

Trade Notes.

All who appreciate good work, encourage British productions, and admire artistic effect, will find much to admire and excite satisfaction in the new series of Christmas Cards issued by **Messrs. Alexander Baird & Son.** Many features of this series are worthy of the special attention of all concerned in the sale and use of the cards, the enterprising manufacturers having evidently gone thoroughly into the business of leading and supplying the public demand. It is not too much to say that Messrs. Baird & Son have, in these cards, fairly excelled themselves, and it is flattering to British lithographers to find such exquisite work being produced in Great Britain.

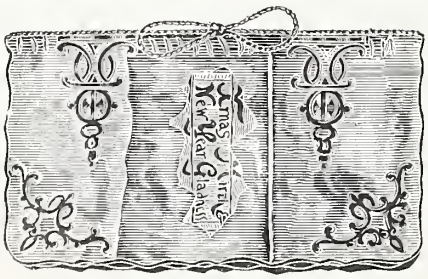
Amongst the various classes may first be mentioned the

COLOURED SERIES,

these embracing designs in many shades and tints. The subjects are appropriate, and neither formal nor conventional, but a happy mingling of the free and graceful, which must greatly attract lovers of the tasteful. Examination shews these cards to be partly lithographed and partly hand coloured, the effect being exceedingly good. Here Messrs. Baird have triumphed in facilities for perfect printing in exquisite taste. Floral designs, especially those including the May blossom, and swallows, owls and robins in others, are used with admirable effect. Graduated tints and gold-tipped tracery are noticeable, as is the perfect harmony of colour prevailing everywhere. In the

BLACK AND WHITE SERIES

is included a wonderfully attractive set of views from photographs. The ever-varying factor, known as public taste, has called for this pretty



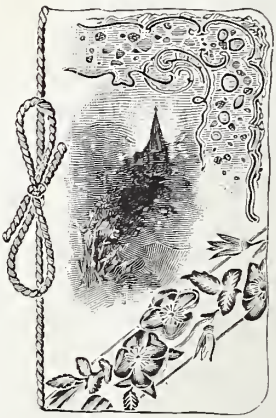
class of card, and with characteristic enterprise, Messrs. Baird have this year added a complete photographic studio to their works, specially adapted for the production of their black and white series of platinotypes. The designs and subjects are all taken from oil and water colours, specially painted for this series, the intention being to give something quite original and at the same time artistic. In this the firm have succeeded admirably, and the pretty platinotype illustrations will doubtless find their way everywhere. To comply with possible requirements, in some instances various portions of the border ornamentation and the corners are finished with gold, either blocked or embossed, thus heightening the effect.

It must be admitted that Messrs. Baird always provide novelty in their subjects and designs, but they have undoubtedly played a "trump card" in their

"DOCUMENTS OF OLD."

In this they have succeeded in following lines of good taste and harmony combined with novelty.

The cards in this series are made to resemble ancient MSS., and are well got-up to imitate the time-stained parchments to be seen in many of our institutions preserving these interesting mementoes of past generations. Not only in colour, but in shape, are they made to resemble the old-world originals, besides being apparently sewn together as of yore, and these "antiques" bear embossed designs of horseshoes, birds, and picturesque buildings; gold being effectively utilised. The insets are similarly tinted with clouded gold borders and lettering in gold.

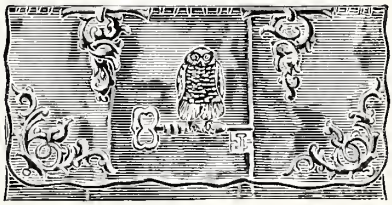


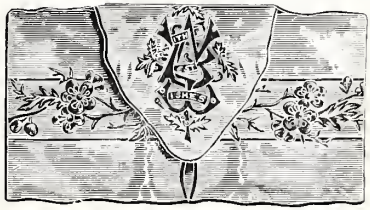
The autograph boxes are certain to become very popular, the style suiting most people. There are in all eight boxes, one at 48/- per gross boxes, and seven at 96/- per gross boxes.

Manufacturing stationers agree that the private Christmas card trade increases in volume yearly,

and this is found to fully coincide with the experience of Messrs. Baird, the private Christmas card forming one of their largest departments. All the cards are supplied without the inset containing verses if required for private Christmas card use, so that this increases the already wide variety at the disposal of customers.

Quite apart from their artistic merits, and these are very considerable, the various series derive special value from being engraved, lithographed, painted, photographed, and stamped wholly at the Kelvinbridge Works, Glasgow. Thus they are genuinely British-made, and those who practically encourage home productions can here find pleasure not only in avoiding foreign-made work, but in obtaining really good "home-made" stationery.





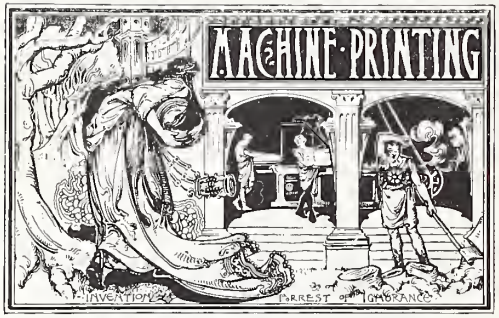
Answers to Correspondents.

In answer to "R.M.," of London, asking for advice as to where to buy the best litho brushes, or to make the same, we can say that he has certainly gone to the best suppliers in the trade in Messrs. T. Cornelissen & Son. He knows by bitter experience, in which we can heartily sympathise, that as yet there is no maker of brushes for litho artists who has put the correct article on the market. The cutting down of small water-colour sables seems the most satisfactory. The most useful sables for this purpose are those at about 1/3 or 1/6, made up perfectly round, in white metal ferrules. The brush must be carefully selected, and should not contain one curved hair—this is probably the fault of nineteen out of twenty brushes. The cutting down may be safely left to necessity. Some brushes will work very accurately without cutting for some time; then they may only require one or two hairs trimming off. If the brush is too full in the body, then it may be as well to cut off the first layer outside, close to the ferrule. If requiring more cutting, take the second layer and cut the hairs off about one-third down from the ferrule. Further layers can be cut away at the same level, until the centre hairs are left long and flexible. It may so happen that there are two points. One of them must be found, and cut away at the ferrule. To work the cutting successfully, a magnifying glass is most useful in selecting the hairs which it is best to cut away. Brushes prepared in this way have been used for work quite as fine as the sample sent. If you cannot succeed in cutting a brush from these directions, we shall be prepared privately to offer further information.

In reply to a question as to who prints transfers for use in transferring to metal or glass, we cannot specialise the names of any firms. But the process is not difficult, and is within the power of any lithographic printer. In the first place the paper is prepared with a soft, easily soluble "transfer" composition of flour or starch only. When this is dry, coat with a solution of gum or gum and starch. When dry, roll well, and print upon it whatever may be desired. Such a paper can be used to receive the whole of a chromo-lithograph, which can be transferred to a metal or glass surface. But to effect this, the colours must be printed in reverse order for tin, and in the correct sequence for glass. Again, work for transferring is drawn the correct way on stone, and not laterally reversed. The printing should be completed by a final printing of flake white all over the paper. To attach the print to the surface, varnish it with copal varnish and lay the print on. When fastened, wash off the paper and the print is left firmly attached. The sample forwarded is of this character, and has become detached by very slight damping.

In reply to Mr. C. Palmer, Auckland, New Zealand, we are unable to say if it is a fact that work is now being bitten in, upon stone, in America. There is no information in this country which would lead to a belief in its existence. If information should come to hand, it will be published in our columns.

"C.C." asks for further particulars of the process of fixing and burning as described in notes on etching on glass. This is a process of a technical and involved character we cannot go into here. Can any reader enlighten our correspondent as to a book, including notes, on the subject?



Our Prize Competitions.

OUR last competition (K) for the best design suitable for a Headpiece to an Article on "Machine Printing," has not elicited many designs suitable for the purpose, but few having attained anything beyond a formal and hackneyed conception of the subject.

The prize of One Guinea is awarded to

MR. R. DOUGLAS STRACHAN,
Edinburgh,

whose design is reproduced on this page.

The second place is taken by "Gyppeswyck," with an admirably drawn design, which, however, might have been still more to the point had some portion of a litho machine been included.

COMPETITION L.—We offer a prize of

ONE GUINEA

for the best design suitable as a

HEADPIECE

emblematic of letterpress printing generally.

The design to be drawn in black ink on white card, and drawn in a manner suitable for zinco reduction to about 5½ × 1½-in.

It is often said that litho artists seem unable to grasp the details of a typical letterpress subject, but we hope this competition will prove the contrary. It is suggested that the design be of a general nature, and full latitude is allowed, so long as the subject is unmistakably applicable.

RULES.

1.—All designs should be signed with a *nom de plume*, but the correct name and address of each competitor must accompany each design submitted, and will be used in the case of prize winners.

2.—All designs for competition must arrive on or before Monday, July 15th, 1895. The award will be published in the August-September issue.

3.—Competitors should address designs for competition to The Editor, BRITISH LITHOGRAPHER, De Montfort Press, Leicester, and envelopes should be marked "Prize Competition" in the top left-hand corner.

4.—The decision of the Editor must be final.

5.—The Editor reserves to himself the right to reproduce any design sent in besides the successful design.

6.—The Editor cannot hold himself responsible for the return of unsuccessful designs.

Correspondence.

To the Editor of THE BRITISH LITHOGRAPHER.

SIR,—I thank you for your kind reply to my letter of the 6th, and beg to say, in answer to your request, that I have not yet ascertained the name of the plate with which we are experimenting. Since writing to you I have seen the plate (which I had not before), and I think it is merely unprepared zinc with a very fine grain. While waiting for your reply I have tried it according to hints gathered here and there in the B.L., and have had satisfactory results. I have first flooded it with alum as prescribed by A. J. Moses, and then proceeded as in "Questions Worked Out," No. 1, page 16, of the B.L. The first thing I tried was a memo. form from copper-plate, and it was all I could desire. After this I tried other things such as a solid label (retransfer), a very fine visiting card, and a view. I was in doubt whether to polish an old job off the stone. A. J. Moses in his remarks uses the expression "after polishing the plate," so I perhaps should not have been wrong in doing so, but I thought I would use a hint thrown out in No. 5 of the B.L. page 8, and up to now it seems all right. After washing the ink off with turps I rubbed it well with a solution of caustic soda, dried the plate, washed it with weak citric acid, and when that had dried used A. J. Moses' alum solution, and it was ready for transferring. I have had such satisfactory results that I shall go on I think in this manner, unless it be that I may leave the nitric acid out of the alum solution. I presume the nitric is merely to give it a fine grain. In one article in the B.L. it says that nitric acid forms an oxide on the plate which is detrimental to the job, but according to No. 1, page 22, ammonia will remove all trace of the acid. So if I take to polishing the plate I shall slightly grain it with nitric acid, wash it with ammonia, and then give it the alum.

Again thanking you for your kindness in replying, and also for what I have learnt from your "Practical Lithography."

Sheffield, Yours truly, E. T. W.
March 25th, 1895.

AFTER the distressing period of bad trade it is reassuring to gather so many reports of a return to prosperity. Our American friends have suffered equally with the trade on this side of the world; but to judge by the information concerning the resumption of manufacturing in all lines and the increase of wages in many, the better days are not only coming but are at hand. Let us hope that nothing will be allowed to form a disturbing element in the growth of prosperous times; and if employer and employé work together with such an end in view, this should not prove impossible.

VOL. IV.—No. 24. AUGUST-SEPTEMBER, 1895. PRICE EIGHTPENCE.

ISSUED EVERY OTHER MONTH, ABOUT THE END OF SEPTEMBER, NOVEMBER, JANUARY, MARCH, MAY, AND JULY.
SIX NUMBERS FOR 4/- YEARLY.
Foreign Subscription (post free) 5/- Yearly.

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TO OUR READERS.

THE present number forms the completion of our Fourth Volume, and with it THE BRITISH LITHOGRAPHER ceases to exist as a separate publication, but from this date will be incorporated with THE BRITISH PRINTER.

Four years' experience in the production of this journal has overwhelmingly demonstrated the fact that British lithographers as a body cannot support a publication solely devoted to their interests.

The proprietors therefore formally announce that all rights in THE BRITISH LITHOGRAPHER are now transferred to THE BRITISH PRINTER.

OUR SUPPLEMENTS.

THE **Chromo Figure Supplement** is a capital example of this class of work, produced by Mr. A. Emery, 78 Cross-street, Manchester. As an example of portraiture, the subject shews taste and skill in no small degree, whilst the border design instances the dexterity of the artist in another important direction of his business. Mr. Emery is a National Prizeman and Medallist, and has been very successful in producing novel designs and appropriate and pleasing subjects for his many customers.

The actual printing of the supplement has been done by Messrs. Widdowson & Co., King-street, Leicester, who have earned a reputation for skilled workmanship and high-class production. The inks used were manufactured by Messrs. Mander Brothers, the colours being yellow, dark brown, buff, light brown, dark red, pink, flesh, light grey, dark grey, light blue.

The Box Label Supplement is a typical design in colours, appropriate for a shoe manufacturer. This class of label design should be legible, chaste,

and effective, and withal simple. The printing is done with Messrs. Mander Brothers' deservedly popular "fast colours," the inks used being label red, art blue, and yellow madder.

The Arms Supplement is a further contribution to the lithographic artist's stock of references and subjects for designs. Armorial designs so frequently enter into the composition of illuminated and ornamental work, that the value of these outlines presented with the B.L. must be admitted by all. Artists would do well to collate the set.

Celluloid.

So many articles are now manufactured from celluloid, both useful, ornamental, artistic and otherwise, some of them marvellous imitations of tortoiseshell, ivory, etc., and printers are sometimes called upon to utilise these as printing surfaces, that a short account of the process employed for the manufacture of this useful substance may not be out of place. *Invention* says that for this purpose unsized paper is first taken and pulped or shredded into strips about ¼-in. in width, and then treated with acid to transform it into cellulose; the paper being submitted to the action of the acid, for the required time, in large stoneware vessels or baths, then removed, and after careful washing placed in centrifugal machines to remove any excess of water. The workmen performing this acid treatment are clothed in rubber, and their faces have a ghost-like appearance, which testifies to the strength of the chemicals used.

After being spread out for a considerable time to thoroughly dry on the drying tables, the substance is taken to the dehydrating rooms, where camphor is added to it, the two ingredients being carefully weighed, mixed, pressed and crumbled up, and then presenting the appearance of a mixture of paper ribbons and white sugar, the odour alone denoting the presence of the camphor. The mixture is now ground and pressed by the masticators in the calender or roller room, about a bushel or "batch" being treated at once, the machinery consisting simply of heavy iron rollers mounted in a horizontal position and geared to revolve inwards. If allowed, the mixture forms itself into a sheet on the roller, but the operator prevents this by continually cutting it off and returning it to the machine, in order that the substance may become thoroughly homogeneous.

In about fifteen minutes a batch will be sufficiently worked, when it is removed in a sheet about one inch thick, presenting the appearance of finished celluloid. These sheets are then placed in a hydraulic form and run under a steam heated hydraulic press, where they remain for about two hours, after which the "cake" of celluloid so produced is removed by unbolting the form, and then allowed to season for a few days, afterwards being cut into sheets of any required thickness by means of a thick blade or "doctor" fastened to a reciprocating table on which the "cake" is placed.

The sheets are then hung up to season and dry for about six months to prevent warping when worked up; hence they go to the various departments of the factory and are pressed, turned or cut, as the case may be, in faithful imitation of the article they are intended to represent.

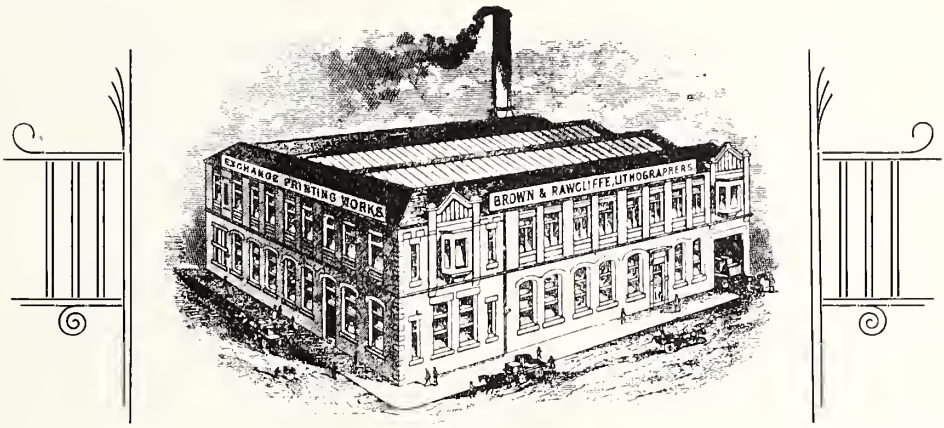
Tortoiseshell, ivory, amber, translucent, etc., celluloid is produced by careful and dexterous treatment in the roller room, the grained appearance of ivory being secured by cutting the sheets into strips one inch wide, and setting them on edge laterally in the hydraulic form before pressing.

Special inks are required to make any satisfactory and permanent impression on the surfaces, the makers supplying the necessary material.

THINNING INKS.—Photo-transfer ink for zinc should be thinned with rectified turps; it is also thinned in this way for photo-litho transfers by some workers; others prefer a mixture of almond and olive oil. Starting ink is thinned with either thin or middle lithographic varnish. Lithographic ink, same as for starting ink. Finishing ink, with turpentine. Very stiff proving ink is best thinned with a commoner and consequently thinner ink. Collotype ink is thinned with "tint" varnish. Photogravure inks, with burnt oil, specially prepared for the purpose in three grades—weak, middle, and strong.

GELATINE TRACING SHEETS.—These are perfectly flat, smooth and transparent sheets of gelatine, of about the substance of drawing cardboard. The sheets are much used by draughtsmen for making reversed tracings in the following manner: a piece of the gelatine is laid over the photograph or other picture to be copied, and the outline scratched on the gelatine with a steel tracing point. Red chalk powder is then rubbed into the lines, after which the gelatine tracing may be placed face downward on the zinc, stone, or other surface, and rubbed with a burnisher until the red lines set off, forming an outline to follow in ink.

The Foia Diecesana, a Roumanian journal, publishes the news that archæologists have lately discovered in the ruins of a Roman fortress at Bersovia documents which demonstrate that the Romans were the inventors of printing. Researches are said to prove that the Fourth Legion, "Elavia Felix," which occupied the province, practised typography with movable types. If this be true, Gutenberg is elbowed out of place, and much of the old bogey of discussion is laid for ever. Who knows but that Senefelder may yet be relegated to second place, as a mere revivifier of an old invention utilised by some other of those Romans?



EXCHANGE PRINTING WORKS, LIVERPOOL.

Successful Lithographers.

Messrs. Brown & Rawcliffe, Liverpool.

In these days of the so-called decadence of lithography, it is pleasant to record an instance of continued success and material prosperity in the departments of chromo and general lithography. Not that these instances are rare, but somehow recent hard times in many branches of the trade, and the development of methods of work seemingly totally antagonistic to lithography, have tended to induce the growth of a pessimistic spirit which is neither good for the individual nor for the trade. Hence it is re-assuring to mention that British lithographic houses do still manage to command the appreciation of customers, and, as in the case instanced, this is achieved with no small degree of success.

The well-known Liverpool firm of Messrs. Brown and Rawcliffe, chromo-lithographers, fine art and general printers, was established in the year 1877, at 33 Wapping, in that city. From the commencement, success so far crowned their endeavours that from having only the ground floor of the building, they gradually extended their accommodation until the business occupied the whole four floors. Again finding this inadequate to their ever-increasing requirements of space, the firm decided, in the early part of 1894, to erect works specially for themselves upon the very best and most modern designs and principles. Our illustration shews somewhat of the extent of the new premises—the Exchange Works, Pall Mall, Liverpool, which were completed and opened in June of this year. The result is a series of departments replete with every convenience for the prompt and careful execution of the largest order and best chromo-lithographic work produced in this country.

Designed after the best models, the building is specially arranged for lithographic production. The machine-rooms are all on the ground floor, the spacious gallery above being used for the lighter departmental work and for stock. The building is lighted by electricity, and is fitted with the latest patent heating and ventilating appliances.

As one of our largest colour printers, the firm has obtained a wide reputation for its standard of work. In photo-lithography much attention is paid to high-class book illustration and the production of views to act as souvenirs and guides for visitors to various places. Their large sets of views illustrating centres of interest like Liverpool and various watering-places are exceedingly creditable specimens of photo-lithography, the admirable views being pleasingly and skilfully produced. So much of this class of work originates from the Continent that it is refreshing to find a British firm taking a superior standard in a vigorous endeavour to substitute home for foreign productions.

At the Liverpool Exhibition of 1886 Messrs. Brown & Rawcliffe gained the gold medal (highest award) for a selection of beautiful work in the several branches of their business. The same care is displayed in all their productions we have met with, and now that free scope has been afforded for work, we trust that an even greater measure of prosperity is in store for the firm.

The Arts and Crafts Exhibition at Manchester.

SCARCELY anything could be better calculated to open the minds of artizans and the public generally than small, well-selected exhibitions of our arts and crafts. Such must have been the impression of the lady who, after looking with all the eyes she had, and turning to her companion said, "When you look at such work it makes you feel as though you know nothing of anything." This late exhibition at Manchester was doubly interesting. It was almost a local affair, and whenever one visited it, it was possible to meet with little knots of people listening to the fullest explanations of the exhibits by one of themselves—one who was possibly engaged at the very works from which the exhibit emanated. It was a homely exhibition and small, containing mostly a few well-selected articles, each one of which had a popular interest. Amongst these reference might be made to some three or four mantelpieces and overmantels, a few chairs, two or three sideboards, and other furniture, and so on through the whole list of domestic articles which will bear ornamentation. Not one particular article was overdone by quantity, with the advantage that each visitor could take away in his mind just the one idea. No one knows the value of such a lesson, unless he be a close student of human nature. The general populace can only learn by short lessons frequently impressed. This is especially so in all branches of higher thought. For as it is in the infant school, so it is in the education of the public taste, the A B C has to be well drilled in before there is any possibility of building the higher mental fabric. This Arts and Crafts Exhibition has been one grand lesson in the elegance of simplicity, and visitors could not fail to realise that the work before them depended for its merit upon the purity of its ornament, rather than upon any complexity or lavishness in design.

Turning to the actual exhibits, our own trade was barely represented, except by a very second-rate show by Messrs. Falkner & Sons. Messrs. Watkinson & Co. had a very interesting case of wood engravings of cotton and other machinery, whilst Messrs. A. Brothers & Co. exhibited the processes of one of the illustrations of the Permanent Collection Catalogue. But art itself met one at every turn. In the bookbinding room alone there was sufficient for a week's good study. Curious and elegant bindings, from seventy-five firms in different parts of the world, shewed clearly that, with the same reading matter printed in the same style, no two firms put on the same, or what might even be called a similar binding. Very few firms paid much attention to the nature of the contents, in most cases the aim seeming to have been to produce a most elaborate binding in accordance with the style of the country. The result has been the collection of some most tasteful work, and other work of the curious rather than artistic character. Amongst the great variety of bindings, it is easy to mistake one country's binding for another, and the whole exhibit shews to English bookbinders that they by no means monopolise the art in taste or finish. The leather embossing and cutting examples were very good and instructive.

Upon the walls of this room were six first-rate chalk drawings by H. Holiday, of "Helen," "Iphigenia," "Jephtha's Daughter," "Cleopatra," "Fair Rosamond," and "Joan of Arc." The drapery in each case is quite a study, and worthy of imitation. The only figure at least objectionable was "Cleopatra," who has anything but a fascinating or imperial appearance. Alongside these panels were seven large and small designs by Sir E. Burne-Jones, for stained glass, mosaics, and bronze tablets. It is scarcely necessary to dilate upon these designs, as they are in the usual peculiar style of this artist—a style which may suit one section of the community and entirely fail to excite the least appreciation from the other section. The work exhibited by W. Crane, in gallery No. 4, can have but one expression of opinion, and that entirely in its favour. These works are book plates, executed with the greatest dexterity in line and colour for reproduction, and a set of pen-and-ink drawings. Such work as his must be really enjoyable to follow. There is a decision of line, so different from a smoky indefiniteness, carrying all the depth of feeling that is wanted, and appealing at once to the mind as work done by a man who knew his own mind when he started, and does not leave the spectator to imagine the rest, as the showman meant when he said, "You pays your money and you takes your choice."

With W. Crane's drawings were some fourteen highly instructive designs by W. B. Richmond. Amongst the pictorial works there cannot be omitted the excellent specimens of stained glass by Sutherland & Co., which could not fail to claim popular admiration. Then the great tapestries by W. Morris & Co. from designs by Sir E. Burne-Jones; the cartoons for wall-paper designs by W. Crane; and the many designs for tile patterns, mosaics, and patterns of all kinds by a variety of artists, complete a goodly list of this class of work, all of which seemed to contain special merit.

Passing from the flat to the production of objects, the wood work may be considered to have a first claim, and foremost amongst the wood workers is an architect, Edgar Wood, whose furniture of all sorts gained the widest public approval, from plain

useful shapes, combined with elegance and simplicity in ornament.

The wood carving exhibits—although few in number—shew great skill. Two specimens from the South Kensington Wood Carving School shew what can be done by intelligent pupils. A specimen of a frieze by J. Phillips is a most attractive piece of work.

The delicate and chaste glass and pottery exhibits were as usual of the choicest type. These materials seem to lend themselves to almost any manipulation, and in the hands of dexterous workmen cannot fail to give every satisfaction. On pottery, the mellowness of tone, the lovely colouring of the work, all seem to blend better than upon any other material. Tile patterns were exhibited in great numbers, and included excellent designs. But amongst the attractive pottery exhibits, the Della Robbia ware cannot be passed over. The shapes are good, the designs and colouring are bold, and, above all, the ware is produced at a fairly cheap rate compared with its attractiveness.

The iron work includes some very fine wrought scrolls and floral ornaments, but much of it seems ill-adapted to the purposes for which it has been designed. The same designs in brass would have been admirable. In iron, the very colour is out of place. The copper repoussé work included some fine specimens, but there again, work seems to have been utterly thrown away upon copper. There is a design for a fireplace, in which the jamb-panels are "Two Syrens," and the head-panel, "Ulysses," which is worked out in copper and built into form. But it is unpleasantly flat, and so very small that it would not be of the least use in any ordinary room. This work is by a good designer (J. Smithies), and one would have expected that the main point of decoration should not have been overlooked so far as to render a domestic necessity an article of ornamentation only. This specimen may be considered only as a model, but its extreme flatness is still a drawback.

In the illuminator's art very little can be seen. There are two specimens by Miss L. M. Pollitt, which bear upon the face of them the touch of a woman's hand—a want of character in execution. One of these designs bears the motto, "It is expedient that every man have one room in his house to himself free from the cumbrance of women," which will be re-echoed by every man who engages in literary or artistic work, for there is nothing which renders confusion more confused than the tidying fingers of the female sex when they get amongst a man's papers.

Altogether, the exhibition must be claimed as a success, and the multitudes who visited it testify to the fact that it was highly appreciated, and that the third exhibition—whenever that may be—will receive an equal, if not greater, patronage by the gradually growing thoughtful section of the community.

Important to Designers.

A TRADE DISPUTE.

MACDONALD *v.* E. TOOTILL AND SON.

At the Manchester County Court, Wednesday, July 24th, 1895 (before his Honour Judge Parry), James Macdonald, trading as the Litho Art Co., Piccadilly, claimed from Ellis Tootill & Son, printers, Minshull-street, £5 10s. for the execution of a showcard advertising the merits of a certain coca wine "invaluable to athletes," etc. The plaintiff appeared in person; Mr. Rylance defended. The defendant said the whole thing was wrong from top to bottom. The plaintiff bordered the showcard with a counterfeit presentment of the cocoa instead of the coca plant. He wanted the words "invaluable for public speakers" inserted. His Honour: Was that in view of the election?—(Laughter.) The words "Coca Wine" were printed in white instead of black, to the great detriment of the showcard. He wanted the coca plant introduced in a natural rather than a decorative fashion. The plaintiff made some alterations, but they were insufficient.—The plaintiff said the card was executed in accordance with a rough sketch which he had made and submitted to the defendants.—His Honour, after examining the showcard and comparing it with one which had been executed by another artist, gave judgment for the defendants.

And the result seems perfectly justifiable. If a customer wants the coca plant, surely the artist does not think he is going to impose upon the customer's ignorance (?) and give him the cocoa plant. The whole transaction shews that a litho artist requires a little education over and above a knowledge of how to delineate, so that he will not fill up a design with incongruous mixtures of foliage and stems which might belong to anything. More often these bits of foliage are perfect abortions. One can see plants used for such decorative purposes with opposite leaves, whereas the real plant has alternate leaves. The flower stalks may be seen placed axillary instead of terminal. In scores of cases, the flowers themselves may be seen with petals ranging from five to eight, in flowers that always have five petals only. This points first to ignorance of ordinary botanical forms, and secondly to a want of energy in not going direct to the nearest reference library to secure the proper information. But if in the first instance the apprentice litho artist were guided in a proper way, he would be aware of the importance of correct knowledge in botany, zoology, and ordinary mechanics, so that where his knowledge is deficient he may make references rather than fill up a design with imaginary details.

Turning directly to the subject at issue in the above trial, the following notes on the coca plant

will not be out of place:—*Erythroxylon coca* (the coca plant) is a shrub four to eight feet high, growing wild in Peru at an altitude of 2,000 to 5,000 feet on the Andes. Its leaves are chewed by the Peruvians as a stimulant, which it is said tends to enslave the users to a greater extent than the opium in China, or the strong liquors of this country. The Peruvian miners mostly chew the leaves mixed with the ashes of a chenopod (a little weed, from the seeds of which a brown-coloured broth is prepared, greatly in favour along the Pacific coast). The coca thus used is said to give them great power of endurance on an empty stomach. 30,000,000 lbs. of the dried leaves are consumed annually. The leaves contain an alkaloid known as cocaine (used by dentists to numb the gums whilst extracting the teeth, and said to have a bad effect on weak hearts)—a variety of tannic acid—also a waxy substance called coca-wax.

The coca plant is a shrub with alternate stipulate leaves, and small white or greenish flowers, each having five sepals and five petals. The fruit is a drupe or berry, with one large cell and two spurious cells. The wood is of a reddish hue.

Printed Abroad.

ANOTHER SIDE OF THE QUESTION.

THE "printed abroad" disgrace is being maintained well to the fore at present, and the trades' unions and lithographic societies are doing all they can to remove the impediments to better trade. But there are considerations quite out of their reach, and some of these are aptly noted in a letter on the subject from the president of the Lithographic Stone and Zinc Preparers' Society. As is pointed out, we have to remember that Germany was the first to start lithography, and that it comes to us second-hand; further, that we cannot compete with them in many classes of work. He considers this is due "to our neglect of technical education. Everything here is done in a hurry. Abroad they are improving; here we seem to be going back. If the employers of this country really desire to keep English work for English workmen, they must not stint the work for an extra colour, nor compel the workmen to scamp the work by demanding a larger number off the machine than equity demands. Proper time will produce proper work, both by artist and printer. By attending to these hints we shall be able to keep our work at home."

"I AM told," said the caller, "that your husband is engaged on a work of profane history." "Yes," replied the author's wife, "it certainly sounded that way when I heard him correcting the proofs." —*Washington Star.*

Plate Printing.

WE understand that Mr. Amos Henry Smith has been successful in taking out a patent for improvements in and relating to the art of plate printing. The object of the invention is to gather from a plate, previously inked, the design, lines, or engraving, and transfer in ink the design, lines, or engraving of such plate upon the surface of another engraved plate, which has been previously inked, wiped, and polished ready for printing, whereby, when the latter plate is printed from, it will produce a result which is in effect the combination of the design, lines, or engraving of the two plates. To accomplish this two plates are first prepared, one on an engraved plate, such as a bank note or draft plate, in which the lines or designs are intaglio, the other a plate or other suitable printing surface, having a design preferably of engraved lines, which may be in relief or otherwise. The first or intaglio plate is then inked, wiped, and polished ready for printing. The second plate is then inked, either simultaneously with or after inking the first plate, and a surface, preferably of gum or composition, applied to the second plate, and the design or engraved lines of the second plate transferred in ink to the gum or composition surface, which is in turn placed upon the surface of the first plate, which has been prepared as above stated, and the design or engraving of the second plate transferred from the gum or composition surface to the surface of the first or intaglio plate, thus doubly inking the same and causing it to carry the design of the two plates. The paper is then placed upon the first plate in the ordinary manner, and the same run through the press, producing a result which is a combination of the design or engraving of the two plates in their respective shades and tints. The transferring surface may be formed of any suitable gum, composition, or other suitable material, which will take the inked design or lines from one plate and transfer the same to the other plate. The said transferring surface may also be a flat surface, or may be in the form of a roller. This transferring surface, it will be noted, transfers from one plate and superimposes upon the surface of another the design, lines or engraving in its different shades and tints. The process simplifies the art of plate printing, and greatly reduces the time and labour to be expended, particularly in printing bank notes, drafts, bonds, or other securities.

The Art Decorator for August is an acquisition to designers and art workers. Its contents include some charming examples, in colours, of Hungarian ornament; a magnificent bird panel; panels with flat ornament; studies of centaurs, and a beautiful study of "La France" roses. The July number commenced a new volume, the seventh series, of this most useful portfolio.

Imperial Institute Exhibition of Photography.

To those who have not yet visited this exhibition there is a treat in store, if they will only go to learn all that is to be learnt. The practical production of collotype prints by Messrs. Waterlow & Sons will alone repay for the time spent. The prints being turned out, are those large oblong studies of the same class as Downey's studies—in fact, from negatives lent by Downey. To stand and watch the methods of rolling up, the damping, and pulling the impression, as well as the simplicity of masking, are in themselves a lesson which every litho printer could learn at once, and when necessary bring into practice. Never lose an opportunity such as this. The work is good, and the printer is not by any means a novice, having had some ten or eleven years' experience. The work turned out is highly creditable, and is a good test of the process of collotype.

As to the exhibit of Woodburytype by the same firm, well, it is there only in part, and that part the printing method, which has every appearance of the utmost simplicity. The most interesting part—the preparation of the printing blocks—is not exhibited, therefore the process fails to excite curiosity by reason of the absence of the details of this wonderful process.

The photo and photo-zinc block processes, so well illustrated by working plant by the Polytechnic Institute School of Photography, cannot be taken as exhibiting the production of the highest class of work. It should be understood that most of the work is from the 'prentice hands and must be judged accordingly.

In Room V. the School of Military Engineering at Chatham has a fine series of exhibits. The work is mostly fine plan and map work, and the exhibits shew the negative from the MS. work, followed by an inked up and developed photo-litho transfer, then a litho stone with a similar transfer on, and lastly a print from the stone. In some cases there are zinc plates with transfers on instead of stones. The lesson is obvious that excellent work is printed from stone, produced through the process of photo-lithography from very finely drawn large originals. It is well worth close examination to see how clearly the transfer is put down, and the clearness of the finished print. Visitors to the exhibition might note that this and other important exhibits are not mentioned in the catalogue.

Amongst the many interesting specimens of the three-colour printing process—than which there are none better than those which have appeared in THE BRITISH PRINTER—are specimens of colour work not restricted to three printings. Most of our readers will remember well the Christmas supplement of *Black and White,* entitled the "Last Grip," which came under review in our issue of December last. At that time we pointed out it was a chromotype print, and the present exhibition proves that statement by an exhibit of the successive proofs. But it will scarcely be credited that such a comparatively flat-looking print should have required eight blocks for its production. The work may be looked upon as an experiment, which to the artist and lithographer proves that as yet more energetic work and cheaper work can be produced through chromo-lithography than by the chromotype process. Of course, in time improvements will come, but they are more likely to come by employing litho artists to supervise the production of the colour blocks, than by depending upon photography alone.

In our previous notice of this exhibition much matter of interest was pointed out, and with the present brief summary of important points, it is to be hoped that all who have the opportunity will not fail to make a good use of the present exceptional collection.

A Demand for Artists.

THE general improvement in trade conditions in the United States is evidently beneficially affecting the lithographic industry. Commenting on the unprecedented demand for good artists, *The National Lithographer* says that it is only a few weeks ago that some of our most brilliant designers, who have done so much towards bringing poster lithography up to the present high standard, were idle, out of work, not knowing where to get a job. But what a change has taken place in New York! We are unable to give the name of a designer of any note in the theatrical line who is willing to change or is not bound by contract to stay with his present employer. Colour artists are scarce, while black and white designers are commanding from seventy-five to one hundred and fifty dollars per week.

In the commercial department the conditions are fast assuming the same appearance. Many of the larger houses are quite slow, while the medium concerns have taken on the best artists to be found, and all they can get of them, at figures nearly double those they obtained during the past winter. The art departments of the daily press have opened fields for many who but a few years since were earning a precarious existence in lithographic art rooms, but the most agreeable feature is that only first-class workmen are wanted.

STUDENTS in lithography would do well to look up the Answers to Examination Questions in the present and former issues of B.L. These cover the ground for all class work.

Collotype for Lithographers and Photographers.

ON all occasions, by exhortation and by series after series of lessons and papers, we have urged upon lithographers the value—aye, the necessity—of undertaking the practice of arts accessory to lithography. And this is especially true of collotype. The photographer who is being urged by the photographic trade journals to undertake his own collotype printing, doubtless already has many advantages in knowing how to make plates, and also in possessing the apparatus requisite for the greater part of collotype production.

On the other hand, the lithographer has all the advantages possessed by a practical knowledge of printing by litho methods, and thus he is specially equipped for undertaking collotype work. He has then to undertake the photographic processes involved in the art before he can claim to be fully provided. Thus lithographer and photographer each possess one half of the collotype business knowledge, and each has to learn what the other already knows before undertaking work. For the sake of retaining a distinct branch of lithography in the trade, the lithographer has been urged to study photography, and in numerous cases has done so. In some few instances photographers have also applied themselves to the acquisition of lithographic printing methods.

The result, however, has not proved particularly satisfactory, and for two reasons. One is that the two professions were thus brought into direct competition—apparently taking work from each other, and the other is that interest in collotype has been allowed to decline somewhat. As regards the former objection, lithographers apparently possessed the advantage, and ought to have shewn it by superior work. Again, why should not lithographers and photographers work together?

The photographer finds it a heavy burden to purchase collotype printing machinery and pay skilled hands, but very frequently would be glad to prepare the plates if the skilled printing therefrom could be easily carried on for him by a lithographer.

The other reason is perhaps most to blame, for either prices have been too high or the absence of uniformly good work has been noted. It is quite true that although some firms always command a splendid collotype business, others cannot make headway at all. It is suggested that "process" work has proved a formidable competitor, and if energy and perseverance have thus raised "process," all the more credit to its exponents. The one thing collotype printers can do to further popularise their beautiful art is to incessantly strive to "go one better" each time. Given a fair charge for the work, good collotype has many advantages over process in results, but it must be really good.

THE recent competition for the best design for a new postage stamp for the French Republic, has apparently been unsuccessful. We are told the competition attracted a large number of general and trade artists, but the greater part of the designs submitted were very ordinary or mere cartoons, whilst others proved quite impracticable. The Minister of Commerce, M. André Lebon, has however taken a bold step to obtain what the judges desire, and has given instructions to a well-known artist, M. Eugène Grassett, to submit a special design. The reputation of the artist is such that the high confidence betowed in him will doubtless prove well placed.

WE learn that a scheme for the extended study of letterpress and lithographic printing is occupying the attention of the Glasgow and West of Scotland Technical College. At a meeting recently held at Glasgow, it was agreed to represent to the trades concerned that the governors would set on foot and carry on classes provided that a sum of not less than £100 per annum was guaranteed to the college for three years.

THE following selection from the detailed report of a recent picture sale at Christie's indicates the prices obtained, together with a comparison shewing the tendency to an advance on previous prices:—

Subject of Picture.	Artist.	Year.	Price.	Price 1895.
			£ s.	£ s.
The Hayfield	David Cox	1884	220 10	420 0
On the Norfolk Coast	J. Crome	1875	194 5	441 0
Landscape with Cattle	Jules Dupré	1874	272 10	619 10
John Palmer	T. Gainsborough, R.A.	1874	157 10	378 0
Lady Clarges	,,	1878	367 10	2,100 0
Lady Musgrave	,,	1880	1,050 0	10,500 0
Repose	,,	1863	819 0	1,470 0
The Pleiades	H. Howard, R.A.	1827	220 10	50 8
Mutual Confidence	G. Morland	1876	126 0	985 0
Kitty Fischer	Sir J. Reynolds, P.R.A.	1845	199 10	1,365 0
Portrait of Himself	,,	1830	117 12	1,102 10
Lady Shore	G. Romney	1874	150 3	1,890 0
Going to the Ball	J. W. M. Turner, R.A.	1872	1,785 10	2,940 0
Returning from the Ball	,,	1872	1,575 0	2,940 0
Helvoetsluys	,,	1863	1,680 0	6,720 0
Val d'Aosta	,,	1878	955 10	4,200 0
The Letter Writer	Sir D. Wilkie, R.A.	1842	446 15	420 0
A Turkish Coffee House	,,	1842	183 15	420 0
View on the Arno	R. Wilson, R.A.	1827	493 10	651 0

DESIGNED & DRAWN ON STONE BY
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Answers to the City and Guilds Examination Questions in Lithography, May 1st, 1895.

Ordinary Grade.

QUESTION I.—*Describe the differences between transfer papers for the various uses of writing or drawing upon, transferring from stone to stone, and transferring from copperplate to stone.*

ANSWER: The differences made in the composition for the various transfer papers may be summed up briefly as follows:—

(*a*) *For writing or drawing upon,* the composition should contain some hard glue or gelatinous body, not soluble in cold water. This is necessary because in writing and drawing an ink is used which is dissolved in water, which, during the process of drawing with brush or pen, would cause the surface to dissolve and fill up the brush or pen, and ultimately spoil most of the work. This hard gelatine also gives a fine surface, well adapted to fine work. The gelatinous body may be parchment, gelatine, or isinglass, but it can be supplemented by a soft glue, starch, or flour paste, so as to make the paper capable of use upon cold stone.

(*b*) *For stone to stone,* the composition can be as simple as possible. A soft glue or flour paste will do, so long as it fills the pores of the paper, and is rolled quite even. In this process the ink used is a *printing* ink, which will not dissolve the surface; and the transfers should always be put down on cold stone.

(*c*) *For copperplate transfers to be put down to stone,* the composition may be of a substantial body, the body being increased by an extra quantity of plaster of Paris or flake white. Otherwise there is little difference in the ordinary copperplate transfer paper.

The above differences are the common or stereotyped principles of difference customary in the trade. They are, however, not actually necessary. A good transfer paper is made of plaster of Paris, flour, starch, and isinglass, which will suit for stone to stone and copperplate transfers. Another paper, the fine white French transfer paper, which is suitable for all kinds of writings and drawings, has been used successfully for copperplate transfers.

QUESTION II.—*Describe the differences between the inks for writing and drawing upon stone or paper, transferring from plate to stone, and transferring from stone to stone.*

ANSWER: The differences between lithographic transfer inks are greater between the printer's inks and the artist's ink, than between the transferrer's inks themselves. Thus the drawing and writing ink is a strong fat, rendered soluble by the presence of soap, which makes the whole easily soluble in cold water, and the body of the ink is not made up with any extraneous matter other than ingredients necessary to its characteristics. On the other hand, a plate transfer ink may be made of the same constituents as drawing ink, but to them are added one or two of the following materials, viz., varnish, pitch, Venice turpentine, and stiff printing ink. And lastly, the plate ink may form the basis of a stone to stone transfer ink, the full body of which may be made of an aggregate of about twice the bulk of the plate ink, consisting of printing ink, varnish, and dry soap. Or it may be made up with a strong grease, well diluted by a bulk of printer's ink and varnish. The difference in the use of the inks requires certain special features. Thus the writing ink must be soluble in water, easily manipulated in the brush, and a ready and firm drier on stone or paper. The plate ink must be made to soften under heat without melting, and it must be both fine and firm to fill every fine line on a plate, which will leave the plate and attach itself wholly to the transfer paper. The stone to stone transfer ink can be used under such similar conditions to ordinary printing ink, that it does not require to be very much different from such ink.

QUESTION III.—*Point out the modifications you would employ in making up your ink for warm and cold weather, and give your reasons.*

ANSWER: In preparing ink for machining, due consideration must be paid to the state of the temperature in the room. There are times in a year when the wide difference of 30° F. can be noted between the temperature in summer and winter. Fortunately this is not often the case, and it would pay employers better to watch that it does not reach such extreme limits. In some of the hottest days of summer, the temperature may rise from 60° F. in the morning to 80° F. in the afternoon, and in winter the temperature may be 48° F., rising to 70° or 75° F. in the evening when the gas has been lighted two hours. Such wide ranges in a single day affect both paper and ink. The latter can be tempered to a certain extent by the use of suitable varnish. There are several

ordinary printing inks which can be taken from the tins and used without any addition of varnish in warm weather. If any be used, it is very small in quantity, and may be "stiff." In winter such an ink requires grinding in middle varnish, and finally letting down with thin varnish. The latter may be dispensed with, and a small quantity of Manders' pomade used. Such a difference in preparation applies to other inks in a larger degree, accordingly as an ink from the tin requires more or less varnish in the summer to make it workable. The increase in the quantity of the varnish added, as well as the quality used, are dependent upon the fact that the heat of the room causes the grease of the ink to melt in hot rooms, thus thinning the ink sufficiently to work, whilst in cold rooms the grease does not serve the same purpose, and has to be assisted by the addition of another medium. Roughly, it may be stated that: stiff varnish used in a warm room may be substituted by middle varnish used in a cold room; middle varnish used in a warm room may be substituted by thin varnish used in a cold room. But attention must be paid to the variation of temperature in a day, as well as in the seasons of the year. On the whole, although a room may frequently reach 75° F. in winter and 80° F. in summer, there is a distinctly lower temperature prevailing all through the cold weather, requiring the use of thinner varnish.

QUESTION IV.—*What, in your opinion, is the best method of preparing a stone, already printed from, which has to be laid aside for an indefinite time?*

ANSWER: The method which gives the best results in putting away stones with work on, in order that they should be preserved for future use, is one which is simple as well as effective. The main point is to use an ink which will not readily lose its soft greasy nature, and to protect the stone from the oxidising influence of the air. The ink should be specially prepared by mixing together equal quantities of printing ink, tallow, and wax, or by using pure unsalted lard in place of the tallow. Such an ink should always be kept ready for use in all lithographic establishments. To roll the work up, it must be carefully cleaned up and washed out, then rolled up with the above preserving ink. The stone must be allowed to dry, then a sheet of printing paper, evenly covered with wet gum solution, should be placed on the stone carefully, so as to exclude all bubbles of air. If a bubble is formed anywhere, the paper may be pricked to let it escape, and another piece of paper gummed over the puncture. The gum itself must be made by dissolving good gum arabic in cold water, and adding thereto a few drops of izal or carbolic acid to each pint. With these precautions, all the possible sources of failure have been met, and a stone so treated should be quite as easily rolled up after two or three years as after a few months.

QUESTION V.—*Describe any method you may know, or can suggest, of making transfers from stone with long keeping qualities.*

ANSWER: The question of self-preserving transfers upon paper has long occupied the minds of lithographers, and after many experiments it has devolved into the preparation of either a hard greasy ink of a non-drying nature for pulling such transfers in, or the use of a preservative powder dusted upon a good transfer ink. In any case, the transfer paper used should contain in its composition a fair supply of gelatine, so that the composition is not over-porous, and will not absorb the ink or any part of it and destroy its keeping qualities. The ink used should be much of the nature of copperplate transfer ink. Such an ink as is made from the composition of:—

Tallow	4	Wax	5
Soap	2	Shellac	4
Stiff printing ink	4		

would prove eminently suited to the purpose, being tempered with a little more printing ink to make it workable on the roller, if necessary. With an ink of this character the transfer should last at least a year, and probably longer. When required for use, a warm stone should be used, and the process of transferring conducted in a careful, slow manner. When the transfer has been put down, the stone should be allowed to stand for some hours before rolling up. The activity of the ink may be revived by washing the stone over with turpentine before putting the transfer on.

The second method differs but little from the first. In pulling the transfer a good transfer ink must be used, and its non-drying quality increased by dusting upon it a fine greasy powder. Such a powder may be prepared by pounding stearine and fine lampblack until the mixture is a fine powder. This powder can be dusted upon the newly-pulled transfer in the same way as bronzes are dusted on, thus giving the ink an external layer of a non-drying but hard grease, which will become incorporated with the ink, and increase its greasy quality. In both cases the transfers must be put away well covered, and not with much weight upon them.

QUESTION VI.—*Describe your method of setting a stone in machine to register with previously printed work.*

ANSWER: To set a colour-stone to register to previously printed work, much can be done by careful inspection of the position of the last stone before it is removed from the carriage. Thus it is advisable to put the stone well in the centre of the carriage, and all stones which follow can be so placed at the outset, the remaining adjustments being of a more accurate nature. When a stone is in the carriage in its proper position, it is easy to take two pieces of card and mark upon them the exact position of the register marks relatively to the carriage. When the next stone is put in, these marked cards will give a ready and fairly

accurate position for the stone. Then take the straight-edge or gauge—supplied with the machine—adjust it to the marks upon the carriage frame of the machine, and bring the stone into position for the gripper. Still using the gauge, raise or lower the stone by the screws under the carriage until the surface of the stone just touches the gauge, then it will pass under the cylinder at the proper pressure. The final adjustments of the side lay, and the screwing up of the stone in the carriage, are all that is necessary to secure perfect register.

[N.B.—This question was set in 1892, and will be found answered on p. 22, Vol. II. of this journal.]

QUESTION VII.—*Describe the methods of applying leaf metal to printed work.*

ANSWER: Leaf metal is applied in the printing process much the same as by the painter and decorator. The leaf metal purchased in books of tissue paper is cut into such widths or pieces suitable for the work by cutting right through the book. As far as possible these strips should be cut so as to form little books with the back of the original book retained. Then in use, when the printed sheet comes from the press, the tissue is thrown back from the first piece of leaf metal, and the whole book turned quickly over upon the printed sheet, leaving the metal adhering to the adhesive ink. In a similar manner the metal is deposited, piece by piece, until the whole of the work is covered. The sheet with all these pieces of metal adhering is run through the press on a clean sheet of paper, or on the back of the next sheet in course of printing. The metal is thus pressed evenly down, and the sheets are allowed to dry for a day or two. The surplus metal is dusted off with a silk duster or other similarly soft material, and the sheet will be ready for use or for further printings to be added. Any good bronzing ink is suitable for metal work. Thus an ink of:—

Mid. varnish	2 parts	
White wax	1 part	
Copal varnish	⅛ ,,	or less
Manders' pomade	⅛ ,,	
Burnt umber to colour		

will be found to work well, and be of good strength. The strength can be increased when highly glazed boards are used by adding a very little flour paste.

The use of metal is likely to fall into disuse, now that Messrs. Eiermann & Tabor have placed upon the market bronze powders which can be so used as to have the appearance of metal.

QUESTION VIII.—*What methods do you know of making up printing inks suitable for bronze and metal printing?*

ANSWER: The wording of this question renders it open to more than one meaning. It is probably intended to ask: "What materials, and what quantities of each, should be used in making up printing inks suitable for bronze and metal printing?" If this inference be correct, then the recipes for good bronze and metal inks may be set forth as:—

BRONZE INKS.

1. Middle varnish used to thin for printing.
   Manders' pomade ¼ oz. to 1 lb. of ink.
   Copal varnish used as a drier.
   Burnt umber } ground into an ink.
   Thick varnish }
2. The same as above, with small quantity of flour paste added to assist in binding the varnish and bronze to the paper when very hard papers are used.

METAL INK.

Burnt umber ground in stiff varnish used to colour.	
Mid. varnish used to thin	2 parts.
White wax used to soften	1 part.
Manders' pomade used to soften	⅛ ,,
Copal varnish used as drier	⅛ ,,
Flour paste used to give adherence when hard surfaces are used	⅛ ,,

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QUESTION IX.—*What variations would you make in "proofing" a chalk transfer and a drawing made direct on stone?*

ANSWER: This question seems a little vague. But it is probable that it means to ask the question as to what variations in proving would be made between a transfer upon polished stone from chalk or grained paper, and a chalk drawing made direct upon stone? And in treating this phase of the question, it would not be that there is much difference in the principles employed. The very slight differences would be in details. Thus:—

POLISHED STONE TRANSFER IN CHALK.	CHALK DRAWING.
1. After transferring, would stand some time before being gummed up. The gum having dried it can be washed off, and a very weak etch of nitric acid in gum brushed over.	1. The fresh drawing from the artist is at once etched by any favourite method.
2. After etching, wash, gum up, and dry.	2. After etching, leave gum solution to dry.
3. Wash out with turpentine and oil mixture, and roll up steadily in a medium ink.	3. Wash off gum, and commence rolling up steadily with a firm ink. Occasionally pull impressions until all the original chalk has been pulled off the stone, and replaced by the ink on the roller. Then wash out the work and proceed to prove.
4. Use any medium ink, on ordinary black roller with plain backing. Moderating the speed of rolling to the character of work and consistency of ink.	4. Use only a firm ink, on a good nap roller, with soft blanket backing. Rolling steadily to reach all the work in the grain.
5. Use cloth or leather for damping, and damp regularly and well.	5. Use sponge for damping, and do not damp much or too often.
6. Use any good enamel or printing paper.	6. Use only a good-bodied, soft-faced paper.

It will be noticed that in the first section of these comparisons etching is recommended for the chalk transfer. This may raise objections, but if there is any truth in the principle of etching a grained stone to convert the soap of the chalk into an insoluble compound, then the same practice must be adopted wherever chalk is used. The same chalks are used, the same amount of soap is present, and the same need exists to convert it

into an insoluble material. If this were more commonly adopted, chalk drawings from transfer would be altogether smarter.

QUESTION X.—*How would you proceed in rolling up and taking proof from an ink drawing on stone?*

ANSWER: To prove any ink drawing upon stone, gum it up and allow the gum to dry. Then wash off the gum and proceed to roll it up. The character of the work will decide the consistency of the ink to be used. Fine close work will require firm ink and steady rolling, other work being treated proportionately less scrupulously. Having rolled or rubbed the work all up, and having decided that it is perfect and has a good hold in the stone, then wash it out and roll up as well as possible. With plenty of gum water on the stone and in the sponge proceed to etch away all scum, and polish off all large masses of unnecessary ink. With a scraper clean up all the lines and fine spaces. To keep all these erasures down, etch quickly with weak nitric acid solution in one sponge, followed by a water sponge. In this way the stone can be thoroughly prepared for the prover. The stone is then washed out again, carefully rolled up. and an impression taken to see if it is correct. The stone being gummed up and allowed to stand, is next taken up by the prover, who washes it, damps it, rolls up the work and takes the proof.

QUESTION XI.—*Describe the method of making litho printing varnish.*

ANSWER: The manufacture of litho printing varnish has for its objects the elimination of a mass of grease and albumen from the original oil, and to reduce the oil to various consistencies, in which heavy and light pigments can be suspended to form printing inks. The varnish, too, has certain good drying qualities which have been enhanced by the process of manufacture.

Varnish is formed from linseed oil. This oil is extracted by pressure from linseed, and in that condition is a pungent oil, containing a large percentage of gummy matters. By allowing the oil to stand in vats for two or three years it mellows, and is ready to be made into varnish. The raw oil contains several non-drying fatty compounds which must be got rid of. The oil is put into large boilers, in which is arranged a coil of piping having a number of perforations all over its surface, and above this coil is a whirler fitted with numerous paddles. In action the whirler keeps the oil in constant agitation, whilst from the tubes a large quantity of air is forced by pumping into the oil, and assists in oxidising and reducing its consistency. At the same time a steady heat of about 120° C. (20° C. above boiling of water) is maintained until the oil is reduced to the commercial article known as "boiled oil." This boiled oil, by further treatment in similar boilers fitted with hoods to catch the fumes and capable of being lowered to extinguish the flames, is reduced to the different consistencies of varnish. During the boiling in these boilers a volume of white fumes rises, which can be ignited. When these fumes are ignited, they are allowed to burn a certain time and then extinguished to test the thickness of the varnish. At the same time all scum is skimmed off the boiling oil. By long experience it can be determined how much burning is necessary, otherwise experiments are conducted from time to time to prove if the varnish will pull out in strings. According to the length of string it will pull, so may the consistency be gauged. As each kind of varnish is required, so is the boiling and burning carried further and further. The stiffest varnish being that which is burned for the longest time.

QUESTION XII.—*Describe any mechanical methods you may know of facilitating stipple effects.*

ANSWER: Stipple effects can be very closely imitated by the mechanically stamped gelatine sheets known as Day's medium. There is perhaps no other method which gives such excellent results. The process consists in using gelatine sheets, stamped with any grain or stipple—and the variety is considerable—in the same way as transfers of keys from gelatine. The stamped films are filled with transfer ink and cleaned up in the same way as copperplate. When full of ink they are fixed in a frame, and the latter is fitted over the stone. The stone having the work planned out upon it, or an offset, is ready to receive the grain or stipple. The transparency of the film allows the work on the stone to be plainly visible. The stipple is then burnished upon the stone, heavily or lightly, and just where it is required. After which it is treated as an ordinary transfer.

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Honours Grade.

QUESTION I.—*Describe the qualities necessary in printing paper for good chromo work, and describe how such qualities are imparted to it.*

ANSWER: A good chromo printing paper should possess the following qualifications:—

(*a*) It will not stretch during the whole printing process.

(*b*) It shall be either sufficiently thick or of good body in itself to take any number of printings, one upon the other, so that they will be absorbed to such an extent as not to dry hard and glossy.

(*c*) Or, it should be coated with an absorbent surface, to serve the same purposes as set forth in (*b*).

(*d*) It should be free from all chemical impurity.

(*e*) It should be a good white, and not sized to any great extent.

To obtain these characteristics, the paper must be made of a good cotton-rag basis, assisted with a small proportion of linen, and rather more of the hemp constituents. The thickness of the paper

can be regulated in the machine. Its purity may be tested with litmus; but, as a rule, paper makers are too careful of their machinery to allow any acidity or alkalinity to exist in the pulp. The whiteness will depend upon the quality of the rags used, but it may be improved by a judicious use of good blue and red colourings in the making of the pulp. The sizing must be ordinary engine sizing, of resin and starch, and not added in more than one-half the usual quantity for ordinary papers.

The most important points, however, are to have the paper of an absorbent character, and so that it will not stretch. Both of these conditions are almost equally essential, the latter one, perhaps, having the greater importance.

Several methods are in practice to assist the paper against stretching, including a recently published method, which has proved very successful. In this method the paper, before printing, is run through the machine, lengthwise as well as the narrow way, the first being all important. In another method, it is assumed that the paper has not been first run through, and it is at once fed from the machine as printed into a drying machine (Jennings' patent), which can be so regulated that the paper is returned to the machine for the next printing of exactly the same size as before any printing was put upon it. In a third method, the paper is previously run through on both sides upon a stone covered with a flat tint, inked with flake white before the chromo is commenced. This last has been proved most effective. And lastly, to prevent stretching as well as give body to the paper, it is a very common practice to use dull enamelled paper having a surface of flake or zinc white, or some chalky compound, which gives a firmness as well as plenty of material to absorb the inks.

To assist chromo printing, when the paper is thin, or paper and enamel are both thin, it is an excellent corrective to use a small quantity of Manders' pomade in all the coloured inks. It assists the inks to become absorbed into the paper and mellow into one another, so that the finished print does not appear a glossy or mottled mass.

QUESTION II.—*Describe any bronzing machine you may be acquainted with, and the way in which it is best used.*

ANSWER: A description of Silverlock's bronzer is an answer to this question, and most lithographers are well acquainted with these machines. As to "the way in which it is best used," this question is somewhat obscure, for there is only one way of using a bronzing machine.

QUESTION III.—*Describe the order of printings and the reasons for adopting such order in any work of eight colours with which you are acquainted.*

ANSWER: The order of printing in any given chromo of eight printings always depends largely upon what secondary effects are required. As an example of a chromo-lithograph which could have been as well printed in eight inks as in eleven, may be instanced the "Church at Stratford-on-Avon," produced in THE BRITISH LITHOGRAPHER, vols. II. and III. In this case the result does not by any means give the effect of eleven printings, and it would be comparatively easy to reduce this number by three. If really necessary this chromo could have been produced in six printings. For eight printings the following order is necessary: Yellow, flesh or stone, carmine red, light blue, darker blue, brown, darker brown, grey. Thus the yellow should be somewhat paler, and should be worked under all the green portions, for which a special green was printed. Yellow being so opaque must be printed first. Then follows a flesh, or, perhaps better, a more stony hue, worked upon the earth, buildings, tree trunks, and reflections, which would give the groundwork for deeper and intermediate shades of brown produced by the later printings of light and dark brown. This, too, is somewhat opaque, and must be printed at an early stage. The third printing should be a red of slightly carmine hue, worked solid, and in gradations, to form various browns upon the stone printing, and some of the more brilliant sunlight effects. The fourth printing should be a light blue, to give the first colour to the water and sky, to overlay the yellow to form the yellowish-green, and to give the first change to green of the yellow, which will ultimately be turned a darker green by the dark blue. This printing also assists the formation of browns; and by the addition of a little Manders' pomade the four printings will be softened, blended, and prepared to receive further printings. The fifth printing is a darker blue, to give the more intense green by overlaying the yellow and pale blue. At the same time, it will give the deeper shades to the water, and may be used on top of the stone, red, and pale blue, to pick out darker points in the picture. The sixth printing will be a brown of an earthy hue, to give tone to the river bank, and fall on the other printings to increase the depth of brown. The seventh printing is a darker brown, to pick out the prominent dark lines only. Its use is bare, since the blue has done much in this direction. The final printing is a grey of such hue as to blend the other printings and soften the picture.

QUESTION IV.—*A drawing having been made to, and so marked, seven-eighths of an inch to a foot, and it is then photo-lithographed to a scale of four-sevenths of such drawing, what will then be the scale which should be written on such reduction?*

ANSWER: A drawing made to a scale of $\frac{7}{8}$-in. to 1 foot means that each foot of the object is represented by $\frac{7}{8}$-in. on the drawing. If such a drawing be reduced in a linear direction to four-sevenths ($\frac{4}{7}$) of this size, then every portion originally $\frac{7}{8}$-in. long will be reduced to $\frac{4}{7}$ of $\frac{7}{8}$ or $\frac{1}{2}$-in. Thus each foot of the object will now be represented by $\frac{1}{2}$-in. on the drawing, and the scale to be written upon it will be "$\frac{1}{2}$-in. to 1 foot."

QUESTION V.—*Describe a method by which photographs can be utilised for drawing upon, and such drawings be subsequently reproduced by photo-lithography of the same or altered dimensions.*

ANSWER: Any ordinary silver print may be used as copy for the photo-lithographer when it is necessary to get accurate details in line work only. The treatment of the photograph is to wash it in a solution of salt and water (2-ozs. salt, 1 quart water), followed by immersion in hyposulphite of soda (1-oz. hypo, 6-ozs. water). Then dry it and mount it for drawing upon. The artist must outline and shade up in lines all that is required for the purpose, using a waterproof ink, such as liquid Indian ink, which will not run when washed over. When the work is thoroughly dry, place the paper in a concentrated solution of bichloride of mercury, adding a few drops of hydrochloric acid. This will bleach the photograph out, and leave only the drawing of the artist visible upon the paper. Such a drawing can then be touched up carefully, and finally used as copy for the photo-lithographer or photo-engraver to enlarge or reduce according as required.

QUESTION VI.—*Shew how engraving on stone is accomplished, and describe the printing of the same.*

ANSWER: Stone engraving, although almost obsolete for some years, has received a great revival in the excellent American note and memo. headings, which have all the appearance of first-class copper and steel-plate engravings. The process of stone engraving requires that a stone of a blue-grey colour be prepared with a faultlessly polished face. Upon it is washed a film of good gum arabic solution, to which is added a few drops of nitric acid. The gum is allowed to dry. It is then made wet by allowing an even flow of water to wash gently over it. This flow of water washes off all superfluous gum, leaving an almost imperceptible film of gum in the pores of the stone. To avoid clearing this right out, the stone should not be rubbed during washing. When dry and, on inspection, shewing no signs of streaks or patches of gum, it is ready to rub in the background. A suitable background will be found in fine Paris black. This can be rubbed well into the surface with the palm of the hand, until an even surface is obtained, all specks being picked off with a point.

Upon this black grounding the matter to be engraved is retraced, using yellow retracing paper. Then the engraving is commenced by cutting all the circles with steel dividers specially sharpened at the points for cutting fine lines, followed by the use of other dividers to cut the broader lines as required. To the circular lines the straight ones are next cut and joined up. Finally all the shading is cut in. The work of the engraver being complete, the stone is flooded with a thin greasy printing ink which fills in all the engraving. After a lapse of a little time the stone is washed, using gum water to prevent extra ink catching. The cleaning up of the stone should be a very short process; all ink marks must be polished most carefully to preserve a flat surface, otherwise the ink will catch. When thoroughly cleaned, the stone is ready to print. The ink is applied from dabbers. A coarse thick printer's blanket dabber is charged with thin ink and is then dabbed and twisted about on the stone, so as to ink down into the engraved lines. When it is all well inked, the same dabber, with the same circular motion, will remove some of the surplus ink. That, however, is completely done by using a fine printer's blanket dabber charged with stiff ink and working it over the stone more with a circular wiping motion. A final wipe with the damping cloth will take off the last traces of the ink. Then the stone is ready to print from.

The printing should be done on a good bodied paper, and with a good soft blanket backing to force the paper down into every line. Before the ink dabbers are applied the stone must be wet, and kept wet during the inking operation.

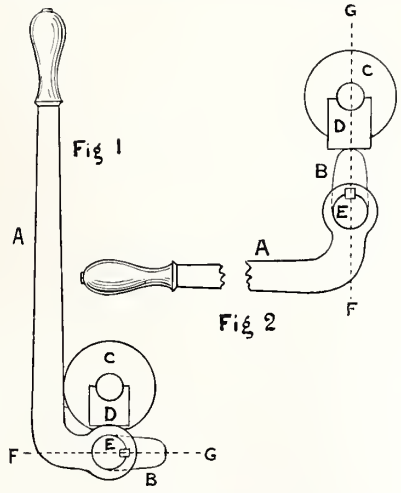
QUESTION VII.—*Describe the process known variously as phototypie, lichtdruck, collotype, heliotype, etc.*

ANSWER: The process known under the various titles of phototypy, *lichtdruck*, Albertype, heliotype, and collotype, as well as Leimtype, is one based on the principle that organic matters, such as gums and gelatines, will oxidise under the influence of light, and when so oxidised become insoluble in water. This latter characteristic also renders such oxidised matter capable of receiving a printing ink evenly upon its surface. Therefore, by making the gelatine more readily oxidisable by the addition of an oxidising agent, such as a bichromate of ammonia, sodium, or potassium, the power of copying pictures from photographic negatives is facilitated. The whole process consists in preparing a thick plate of glass with a finely-ground face, upon which is spread a thin film of substratum consisting of silicate of soda, stale beer, and water. This substratum is dried. The plate is then ready to receive the gelatine film. This film is made from Creutz's middle hard gelatine, bichromate of ammonia, liquor ammonia, and water. This film is carefully spread on the substratum and is then dried at a temperature not exceeding 110° F., in a drying box where light is excluded to a considerable extent and the heat can be thoroughly regulated. The dried films are ready for exposure in special printing frames, made very strong and fitted with numerous screws to force the film into contact with the negative. In such frames there is no chance of opening the back, as with ordinary photographs, to examine the progress of the printing, so the exposure has to be timed by an actinometer. When the exposure is correct the plate is removed and soaked in clear cold water. This soaking continues, with frequent changes of water, at least changing the water half-hourly, until all traces of the yellow bichromate are quite

removed. Then the plate is dried. When ready to print, the plate is again soaked for half an hour, and then treated with a damping solution of glycerine, ox-gall, and water. The rolling up is commenced after the damping solution has soaked into the plate for a quarter of an hour. The rolling up is done with a good nap roller, covered with a medium stiff ink, which covers all the deep and sharp shades. The final rolling is done with a glue roller, covered with a thin ink. This latter may be tinted so as to vary from the other ink already on, and give a fine secondary effect. The printing is effected under a good pressure and at a very fair speed considering the difficulties to be overcome. In printing, a mask of oiled paper must always be used to prevent any ink printing outside the actual picture.

QUESTION VIII.—*Make a sketch of the lever and cam in a hand-press, and describe the working.*

ANSWER: In the accompanying sketches (fig. 1 and fig. 2) the lever, cam, brass and cylinder of the hand-press are shewn. In fig. 1 the parts are shewn in their ordinary position of rest during the rolling up of the stone. The chief feature is the relative position of the parts to the line F G, which has a horizontal direction. The handle A is keyed



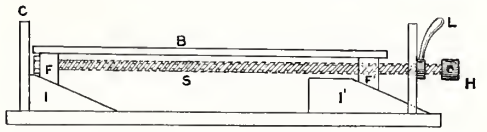
HAND-PRESS. HANDLE, LEVER, AND CAM MOTION.

Fig. 1.—In state of rest. *Fig. 2.—As brought into action.*

rigidly to the shaft E, which has the cam B rigidly keyed to it also. The shaft E runs across the press, and bears another cam the other side, which, when actuated by the downward motion of the handle A, raises a brass similar to D on the other side. The brass D bears the cylinder C shaft. In fig. 2 the motion of the handle A, bringing it down to a horizontal position, has brought the line F G into a vertical position, and at the same time, by the upward motion of the cam B has raised the brass D, and consequently the cylinder C is brought up against the bottom of the carriage, ready to give the traverse of the carriage under the scraper required to pull an impression, and to give the necessary support for the pressure to be evenly applied. The cam B and handle A must always be set absolutely at right angles to secure the best results. If set at less than a right angle the danger is nothing; but if set at more than a right angle, then when pressure is applied the cam will be forced down, the handle flying up and striking the pressman.

QUESTION IX.—*Make a sketch and describe the working of a stone-raising apparatus, and name the machine to which it is applied.*

ANSWER: In the sketch is shewn the general framework of the stone carriage C in a litho printing machine. The bed B of the carriage has two feet on each side, or more according to size, so shaped as to be capable of running up and down the inclines I and I'. Between these feet are two long screws S, which pass out of the carriage and are held in position by lock nuts L with a handle. The screws S are fitted with heads H, bored with holes, into which an iron crowbar can be fitted and caused to turn round. This mechanism shews that in the position as shewn in the sketch, the bed B is as high as it can be driven up the



LITHO MACHINE CARRIAGE. STONE RAISING ARRANGEMENT.

inclines I and I'. By unlocking the nut L the screw S will be freed. The head H can be turned round and the screw will be drawn out of the carriage, causing the feet F to slide down the inclines I and I', and thus lower the bed B. When low enough, the lock nut L is forced up the screw tightly against the carriage frame and there holds the screw firmly.

This form of stone-raising apparatus is fitted to several different makes of machines.

The question is so liable to misconstruction that it is quite possible the above described stone-raising apparatus of the litho machine carriage may not prove exactly what was intended by the examiner.

QUESTION X.—*What is (roughly) the chemical nature and composition of the pigments known as Brunswick green, vermilion, Chinese blue, Indian red, ultramarine, and crimson-lake?*

ANSWER: The following is the chemical composition of the pigments:—

BRUNSWICK GREEN has a basis of baryta, covered by a green compound of Chinese or Prussian blue, with yellow chrome. Or it may be copper treated with hydrochloric acid.

VERMILION—Sulphide of mercury.
CHINESE BLUE—Nitrate of iron, or ferrocyanide of iron.
INDIAN RED—Oxide of iron, or sesqui-oxide of iron.
Ultramarine—Lapis lazuli (mineral). Or as Oriental blue, = Sodium sulphide, ammonia and alumina.
CRIMSON LAKE—The finest colouring matter from cochineal insects.

QUESTION XI.—*Describe some process of making half-tone engravings on copper by means of photography.*

ANSWER: Half-tone engravings on copper—other than the actual process of photogravure, which is apparently not intended by the question—are of a similar character to the half-tone zinc-block etchings now in common use. The differences are in the details, and not in the principles. Thus, a copper plate finely polished is treated with lye to thoroughly cleanse it, washed, and dried. Upon this plate is spread a very thin film of bitumen, so thin as to appear merely like a wine stain upon the surface. The coating is poured on, and equalised by rapid rotation in the whirler for a minute. The plate is then quite dry and ready to go into the printing frame under a reversed negative. The exposure will vary from half an hour to three hours or more, and must be timed by an actinometer or dummy print in another frame. When sufficiently exposed, the plate is removed into a flat dish and covered with turpentine, which dissolves the unexposed bitumen. As soon as the details have all become visible, the plate is removed, rinsed under flowing water, and placed in a bath of perchloride of iron. This etches the face of the copper, and renders it possible to examine the plate to see if all details have come out. If not, the plate is washed again and soaked in turpentine to dissolve out the obstinate traces of bitumen. That being done, the plate is washed and returned to the weak bath of perchloride of iron, in which the plate receives its first etching. The remaining etching may be continued in perchloride of iron baths, or in a galvanic or electroplater's bath. In the latter the lines are engraved with greater precision than in the etching bath, and the best results are obtained by placing the plate to be etched horizontally in the bath, connected to the positive electrode, whilst another plate is placed horizontally above it connected to the negative electrode. The bath itself is filled with solution of sulphate of copper. When the etching has been carried far enough for certain parts, the plate may be removed from time to time and such parts covered with a resist of wax or asphaltum. All etching being complete the plate is taken out, and the asphaltum removed by warming the plate and treatment with strong potash. The plate is then finished for mounting, and is ready to print from.

The bitumen for this process is prepared from the best material obtainable. The bitumen is pounded to fine dust, and poured into methylated ether. The ether dissolves a certain portion of the bitumen. By repeating this treatment all the readily soluble bitumen is removed, leaving the harder material. This bitumen is spread out to allow the ether to evaporate, and when thoroughly clear of it, it is dissolved in benzole. This solution is filtered, and is then ready for coating the plates.

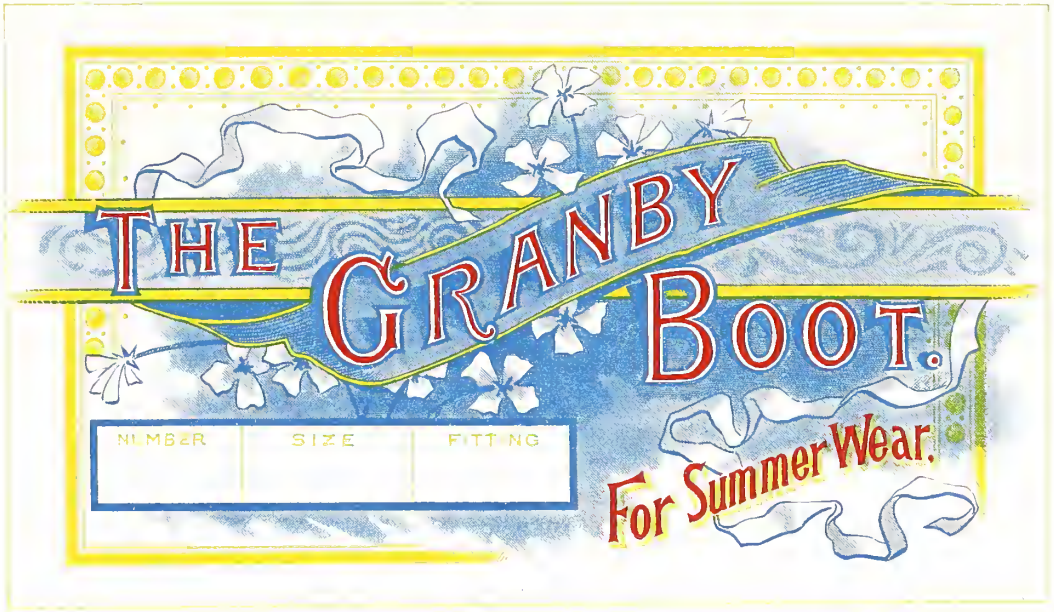
The negatives for this process are taken through some form of crossline or grained screen, placed in the camera, and are laterally reversed, either by a mirror arrangement on the camera or by subsequently stripping and reversing the film.

QUESTION XII.—*Describe processes of reversing black to white upon stone by photography and by manipulation upon stone only.*

ANSWER: This question seems somewhat vague. The first portion asks how to reverse (or more properly transpose) black for white *upon stone* by photography, whilst the second portion asks for processes of transposing upon stone *only*, inferring that the previous portion of the question involves the use of some other medium besides the stone.

Dealing with the matter as strictly as possible, there is the following photographic method of transposing:—The work upon a stone is rolled up well, with as much ink as it will carry without smashing. The impression is taken from this, upon photo-litho transfer paper, and is at once dusted over with bronze powder and talc. Then the transfer is exposed to a good light until all the "uncovered" paper is turned a pale brown. The whole transfer is then rolled up in photo-litho transfer ink until solid all over. This blackened transfer is soaked in cold water until the original printed design comes away because the composition which was under it has been dissolved, it not having been acted on by light. The transfer, after careful washing and drying, will give a transposed image, and can be transferred to stone.

The one method which recommends itself by constant experience, for transposing the finest work upon a stone, is to roll the work up well in a medium soft ink. Upon this ink dust French chalk or talc, which will cover it absolutely and present almost the strongest known resist to nitric acid. When well covered, etch the stone with a strong solution of nitric acid until it has been bitten to the depth of a thin card. Wash and prepare the stone with weak alum solution. Dry and roll in solid with transfer ink. Then with a flat, long piece of polishing stone polish the whole surface of the stone. The portions which bear the original design standing in relief will be the first to be polished off by this process; and by continuing a perfectly even motion in polishing all the relief will be brought down at the same rate. When the polishing has gone so far that it begins to touch the surface which was etched down, cease to polish. Rub, and roll up the black background as fully as possible, dust well with talc, and finally etch down the last remaining relief of the original design. Then the stone will bear an excellent transposition from black to white.



Printed with Messrs Mander Bros. Lithographic Inks.
WORKS- WOLVERHAMPTON. ENGLAND.
0561, Calendar Red, Litho, at 5/- Per lb. 0718 Antwerp Blue, Litho. at 5/6 Per lb.
0757 Yellow Madder. Litho, at 4/- Per lb.

Theatrical Lithographs.

LITHOGRAPHERS in this country will be interested in a subject which is fast becoming a "burning question" in the United States. Recently a meeting of New York theatrical managers was held for the purpose of considering a plan to restrict or prevent the abuses which have sprung up in connection with the widespread custom of issuing complimentary tickets of admission to theatres in return for the privilege of displaying on walls and fences and windows lithographic or other printed advertisements of the performances. The *National Lithographer* rightly states that with the abuses referred to the trade has no concern, for lithographers as a class can do nothing to check them, but it is rather disquieting to the trade to learn that one prominent manager expressed the opinion that, as a last resort, "at a not distant date the use of lithographs in New York City would be abandoned altogether."

There is, however, another phase of the question also quoted by our contemporary as appearing in a prominent New York daily newspaper, which, as entirely opposed to the usual opinions appearing in newspapers, which naturally value their own advertising columns at much more than the chromo-litho work referred to, is a matter that all lithographers doing theatrical posters cannot fail to be interested in. The summing up of the article must commend itself, and doubtless the effect of thus placing the subject will cause those interested to fear the result of an experiment, and thus restrict concerted movement of the kind, which, if it were carried out, might prove exceedingly detrimental to the trade.

The reference is as follows :—

The theatrical managers of New York have been holding meetings for the purpose of acting in concert against what is called by them "the lithograph ticket abuse." Theatrical companies, and especially those presenting sensational plays, depend largely upon the use of attractive or startling coloured prints, which represent either the chief performers in picturesque poses or in scenes of the play most likely to excite curiosity and interest. By the introduction of new processes and the cheapening of old ones, the art of pictorial illustration has come easily within the financial resources of all theatrical managers. If unworthy of admiration as works of art, these theatrical lithographs serve the purpose of the managers, which is to attract public attention in a peremptory fashion.

The necessity for this is apparent when it is remembered that in a considerable number of theatres there is a change of play and of company every week. The lithographs displayed in the leading thoroughfares a few days in advance of the beginning of a new engagement, are a familiar method of advertising, and the public has come to look for them. Of course, the higher class of performances are not thus advertised. Mr. Irving is never represented in the shop windows of Sixth Avenue. Sarah Bernhardt and Jane Hading, when on a professional visit to the United States, do not depend much on cheap coloured lithographs. On the other hand, Mrs. Langtry, Mrs. Potter, Lillian Russell, and other theatrical stars whose popularity is considerable, are not averse to lithographs ; they continue to use them generously.

The custom in the past has been to give tradesmen and shopkeepers, who display these theatrical lithographs conspicuously in their show windows, tickets entitling the holder to a simple admission to the theatre, with a reserved seat on payment of a small sum in cash. Such tickets have been distributed on the theory that the shopkeeper or the members of his family would, in return for window privileges, avail themselves of the courtesy of the playhouse, and thus a reciprocal advantage would be gained without direct payment of any cash. Unfortunately, as the managers now declare, the continuance of this arrangement is not possible. The more desirable show windows on the leading thoroughfares have been occupied by several theatres, and the number of lithograph tickets given exceed the requirements or theatre-going possibilities of the shopkeeper and his family. Unable to use tickets himself, he sought to dispose of them at a profit, and thus there has grown up what are known as "scalpers," that is, speculators in lithograph tickets, which they buy from the original holders, and then, in turn, sell to patrons who desire admittance to the plays at cut rates. There are now about two hundred such ticket "scalpers" in New York, selling on an average twenty-five tickets each, or 5,000 daily, and there has been built up in this way, to the detriment and injury of those theatres using lithographs, a class of theatre-goers from whose attendance the managers gain nothing. In other words, there is a large number of deadheads ; and it is an axiom of the theatrical business that where a person has once enjoyed the favour of free admission to a theatre, he is afterwards reluctant to buy tickets at the box office.

Many theatrical managers, seeing a large number of persons present nightly who have not paid, have endeavoured to abate the abuse by the expedient of printing special dates upon these lithograph tickets, making them available on a stated evening only, and thus reducing their marketable value to the "scalpers." But this expedient has not put an end to the abuse complained of, and so these managers, at their last meeting, determined to abolish, if they could, the use of lithograph tickets entirely and unconditionally.

In those theatres in which performances of a high class are given, and also in those theatres in which plays are presented for a long run, such a

plan may be feasible, but it is doubtful if it will be generally successful. In the first place, the public has become accustomed to theatre lithographs. Popular taste fostered for years cannot be regulated by a resolution suddenly adopted by a dozen managers. In the second place, the large lithograph houses, in the business of which several local managers are pecuniarily interested, derive a considerable revenue from the making of the pictures, which, whatever may be the case in New York, are deemed indispensable to success in other cities. The abolition of lithograph tickets, and ultimately of lithographs, would deprive these concerns of a large revenue, and they will resist the change. But the third and perhaps the chief reason for the belief that the proposed innovation will not succeed, is the almost universal and nearly irresistible desire of actors and actresses, and notably those least conspicuous by reason of their ability or accomplishments, to see themselves presented in poses of a romantic and picturesque character. Managers may be willing to forego this form of advertising, but actors and actresses will not; and thus companies in which stars are prominent will probably adhere to the use of lithographs despite the abuses inseparably connected with them at present, and of which some managers very reasonably and very properly now complain.

Substitutes for Litho Stone.

THE most successful amongst the many intended substitutes for stone are summed up, and their properties detailed, by *The National Lithographer* (U.S.A.) as follows:—

ZINC

is a hard white metal, with a blue shade. When pure it is very malleable, but it is usually brittle owing to the presence of impurities such as lead and iron. Commercial zinc, however, becomes malleable at 100° to 150°C., and may then be rolled; at 210°C. it again becomes brittle, and may be easily reduced to a powder at that temperature. Zinc decomposes vapour of water at a temperature below dull red, and readily, even at ordinary temperature, when it is associated with copper or even other less positive metals.

The pure metal dissolves very slowly in dilute acids, but the ordinary zinc dissolves quickly because the lead contained in it acts as an electro-negative element. Zinc dissolves in aqueous alkalies with evolution of hydrogen. Pure zinc, properly prepared, can be used to great advantage by lithographers for storage purposes. A large number use it for printing surface and get good results, and by the use of hints and recipes already given in our columns these may be obtained by all.

PEWTER

is an alloy of tin and lead. Common pewter contains about 5 parts of tin to 1 of lead. In France a tin and lead alloy of 18 tin to 1 of lead is recognised by law as being a fit metal for wines or vinegar measures. The best pewter is an alloy of tin and about one-half per cent. of copper. This metal contains none of the properties necessary for lithographing. Some lithographers believe a new metal can and will be made that will supersede zinc as a surface for printing plates. Copper may form one of the component parts of this metal. The limited demand for a substitute for stone would scarcely warrant the effort to put such a metal on the market.

ALUMINIUM

has been in the hands of some persons who did not know anything about lithography and did not spend money enough to learn its merits. Further experiments are being made, and, it is hoped, with better results.

Classified by Colours.

UNDER the heading, "The Colours of the Sciences," Herr Hans Ellissen had an interesting paper in the *Nachrichten aus dem Buch-handel*, relative to the adoption of distinctive colours for the bindings or wrappers of books in various sciences.

It seems that in 1887 the British Museum authorities, in order to facilitate the finding of books on the shelves, adopted four colours for four different branches of knowledge, viz., red for history, blue for theology, yellow for poetry, and green for natural science. No special colours, however, appear to have been fixed upon for other sciences.

The writer points out that the German book trade has for many years made use of colours for certain sciences—*e.g.*, green for forestry, yellow for medicine, and black for theology.

It is, therefore, to be hoped that a new impulse may be given to the question, and that the book trade, in conjunction with librarians, may fix upon distinctive colours for all the principal sciences.

The well-known publishing firm of Wilhelm Braumuller, of Vienna, has already for many years given special attention to the matter, and in reply to Herr Ellissen's enquiries, politely furnished him with the subjoined list:—

Orange yellow	Medicine and Natural Science.
Sulphur yellow	Legal and Political.
Grey	History, Geography, and Statistics.
Green	Forestry, Agriculture, and Sport.
Brick red ..	Veterinary Science.
Chamois ..	History of Art, Polite Literature, Philology, and Literary History.
Blue	Theology, Philosophy, Pedagogy.
Brown	Mathematics, Commerce, Mining.
Grey mixture	Military Science.

These may be helpful for further consideration of the subject, but it is desirable to have as many opinions as possible before fixing upon colours to be adopted everywhere with the general consensus of opinion of all interested.

BY CHARLES HARRAP.

CHAPTER XXI.—*continued.*

TREATMENT OF CHALKED STONE.

DURING this process of etching, certain chemical changes have taken place. Before etching, if the stone had been only under gum, and had then been rolled up, the damping water would dissolve the chalk, by reason of the soap in it. But after etching—providing the etch has been fully carried out—such an accident is scarcely if at all possible, for the soap has been converted into an insoluble compound. In the course of etching with gum and nitric acid, the nitric acid sets up a decomposition of the gum, resulting in the formation of various mucilaginous and saccharic acids. As these acids were, while present in the gum, in combination with calcium and potassium, now they are liberated from one combination, they simply join in a similar combination with the calcium of the lithographic stone, and thereby form with the stone a compound of gum similar to gum arabic and acting as a protective medium on the stone's surface. This protective film remains until the water and turpentine ultimately dissolve it out again. The nitric acid also decomposes the soap in the chalks, liberating such fatty acids as exist in the particular fat used to make the soap. These fatty acids being liberated from the alkali of the soap, have an affinity for the alkaline earth (calcium) of the stone, and join with it to form an insoluble soap with the stone. The liberated materials from the gum and soap either join to form other compounds, or enter into compounds with the water used, ultimately being wiped and washed off. The new compound formed between the fatty acids and the stone is permanent, and will not wash off when the gum and other matters are cleared from the surface of the stone.

The strength of etching solutions must be varied to suit the work. The finest work should stand such a degree of strength that when put on the stone it rests a moment, then effervesces and dies away almost immediately.

After the etching is completed, the process of rolling up and proving is commenced by washing off the gum, and with gum-water damping solution roll up steadily with a good fine firm ink on a nap roller. As soon as the work begins to get evenly covered, pull an impression on soft paper—not so soft that it will tear in the grain. This first impression will appear grey, owing to the ink bringing away with it some of the loose chalk. The stone is again rolled up, and a second impression taken with the same result. By repeating this process all loose chalk will be removed, and later impressions will give a firm black appearance, clear in the grain. If there is a want of clearness, or any appearance of cloudiness about the tints, the stone has not been sufficiently etched, and the unconverted chalk has dissolved and filled in the grain. There are two remedies for this. The first is to wash out the work with turpentine; this will remove all the ink and chalk, which, followed by a careful rolling up with a firm ink, will bring up the original work first, and will most probably not bring back the dirtiness, owing to the severity of the "wash-out." If, however, during this rolling up traces of the mischief appear again, continue to roll up until the original work is covered. Then dust the stone with fine resin and give a weak etch, which will probably remove all the dirt from the grain and check any more from coming up. The other method is to roll up the stone evenly, then dust with resin, and etch with a moderately strong solution of nitric acid—about half the strength used for the first etch in method No. 4. By this means an apology for a first etch is given to the work, and such work that is not really strong will be almost etched away. The use of resin in both cases is recommended so as to allow the acid to bite through to a small extent to re-etch the original work and kill the smuttiness in the grain. The first method is the more satisfactory. But, if there is any liability of the work running smutty very early in the proving stage, at the second or third impression, then the work should at once be re-etched in the same manner as at first, but with a somewhat weaker etching solution.

Again, when grained stone chalking is strong, it is permissible to wash out the work with turpentine as the first treatment before any rolling up. Such treatment is severe, and cannot be recommended for the finer chalking, for if fine tints were once bared in this way it is highly probable that the firmness of the ink used would tear off a large proportion of it. The treatment can be tempered, however, by using a small amount of palm oil or stearine dissolved (suspended) in the turpentine, for the finest chalked tints. In adopting either of these washing-out processes, it is almost impossible for any dirtiness to come in subsequently by the unchanged chalk being dissolved and falling into the grain to fill it up, as already shewn above. The experience of many printers

confirms the statement that chalked work of all degrees of fineness may be indiscriminately washed out with turpentine. It is, however, advisable to use discretion in the matter, and avoid the possibility of giving the work a worn-out appearance at the early stage of proving.

The tendency to run smutty may be prevented, if not shewing too strongly, by simply rolling the work up well, gumming up in good thick gum, and leaving to dry and stand for an hour or two.

The possibility of running smutty is not the only fault to be looked for in grained stones. Frequently, from causes very difficult to discover, whole patches of a tint will roll up stronger than other parts; or spots may come up from any little greasy bits of scurf or dandriff, or grease particles in the air, falling upon the stone. The patches of darker tint should be etched away by the use of a fine brush and acid. The spots may be picked out with a scraper. After such treatment, the work must be rolled up rather quickly to tear out the loosened particles of ink or chalk.

Again, whilst thickening is the more common fault of grained stone work, it occasionally happens that the first etch has been too strong, and has left the work with a worn-out appearance, for which remedies cannot be applied which will give back the original appearance. The remedies, however, are worth a trial, for they may save a mass of expensive work. They are as follows:—

(*a*) Roll up the stone well with a good medium ink. Upon this roll up again with a thinned transfer ink; then dust with powdered resin; wash the stone carefully in water, preferably warm, followed by very weak nitric acid, or very weak alum solution. When dry, gum up all the thicker parts which do not require any strengthening, and stand the stone before an open fire. The stone must be watched and examined every five minutes, until the face of it has the chill off, or until other signs in the work itself shew that it must be removed. It is allowed to cool before rolling up. The resin is washed off with turpentine and stearine solution before the work is carefully and fully rolled up in a moderately thin chalk ink.

(*b*) The work having been well rolled up, wash the stone with a weak solution of alum. Allow it to dry. Gum up the stone and dry it. Wash off the gum and alum and roll up with a thin good ink. This should prove effectual.

(*c*) Wash out the stone with a strong solution of stearine in turpentine, and before washing it off, roll up the stone on top of the turpentine. It must be carefully watched, and when blackened over should be washed out again. If the remedy has been at all effectual, as proved by rolling up in thin ink, allow the stone to stand for an hour after such rolling up.

(*d*) In a similar way, the stone may be rubbed over with a flannel dipped in palm oil, followed by a gum sponge. This is likely to feed the weak grease in the grain, and assist it to take ink.

(*e*) Roll up the stone in thin good ink, and allow it to stand. This will frequently cause a thickening up of the whole work, and may improve the general appearance.

(*f*) Roll up in a firm ink, and stand the stone in gentle warmth for a time. Watch that the work does not begin to run. After the stone has become warm, remove it and allow to cool before rolling up in thin transfer ink.

(*g*) A last resource, but not to be commended, is the use of soapy froth, on a flannel, for rubbing up the whole stone. This may bring up the lost work, and it may also blacken the whole stone.

By the application of the foregoing treatment, it is probable that a good printing stone will be obtained. In finishing the proving, the ink should be of the best quality, known as chalk ink—an ink made from the best lampblack or Paris black. The rolling up must be done with a deep nap roller, so that the ink is carried down to the work in the grain. The speed of rolling must be slackened, so that all the work may receive a covering of ink. The fact that the stone is grained shews that its surface has been extended in proportion to the depth of the grain. This extension of surface needs slower rolling. The openness of the face of the stone increases its ability to hold water, and the damping, which should be done with a sponge, must be less frequent than for polished stone. Finally, the proof must be taken upon a good bodied soft (unsized) paper. Dull enamelled paper generally gives a sharp impression, but it is thin, and lacks all intermediate tinting. The backing for printing may be several sheets of thick plate paper, or, better still, a fine blanket.

Corrections upon grained stone are very difficult to make. If the artist wishes to make a correction before etching, the work can be entirely removed by "pecking" it out with the fine point of one of the hard drawing chalks. Ink eraser is also effectual in wiping out a chalked tint on stone, but not so effectual as upon grained zinc. When the stone has been rolled up, the correction is very unsatisfactory. The work to be altered should be grained out with sand, and the stone well washed in hot water, followed by treatment with citric acid, and again well soaked with hot water to remove the acid. Then the correction may be attempted, and it may turn out well—but more often the reverse is the case. If a grained stone has been put away for some time, then it is necessary to well dry the stone before washing off the gum. When thoroughly dry it must be cooled, washed, and rolled up. The old ink—which should be a preserving ink—will yield to the solvent effects of turpentine and carbolic acid; after which the work can be rolled up and any corrections made as already described with graining, hot water, and citric acid.

There are times when it is convenient to use type or other transfers with the grained work. When this is the case, such transfers may be pulled on varnished paper in transfer ink, and run down to the stone in the proper position before the artist commences chalking. Such transfers are run down to the dry stone, and the varnished paper can be peeled off with comparative ease.

Although not absolutely associated with grained stone work, this is the most fitting opportunity to mention that, though a number of the tints in a chromo-lithograph — whether being carried out upon grained stone in chalk, or on polished stone in stipple—may be absolutely flat and capable of being washed in on a polished stone, yet it is far better to wash them in upon "flat grained" stones. Such a course is more likely to ensure perfect register if the other stones are grained ones, and a tint so worked always prints much more evenly than on a polished stone. If the tints be worked on polished stones, then the outer clear margins of the stones should be strongly bitten with acid to give a grain. In both cases the grain of the stone assists the rollers to roll over the stone, rather than skid or slip, without rolling the tint evenly, and causing broad uneven surfaces.

There is no doubt that any printer who undertakes chalked stones should possess wide experience with such work. He should have a first-rate collection of the best works published, and should aim at getting the best possible artistic effect from the stones placed in his hands.

"Famous Views of the World."

AMONGST the variety of publications now before the public, portraying picturesque and notable places from large half-tone blocks, there is one in which an effort has been made to relieve the ordinary black by the introduction of colour. This new venture comes from the office of G. Newnes, Ltd., and is certainly not without merit. The initial difficulties of cost in printing always handicap colour productions, and this difficulty makes itself apparent in the work under consideration. It is practically impossible to select sixteen views in which the same yellow, blue, and red, although supplemented by an extra flesh or grey, are sufficient to give the great variety of hue to be found in the scenery depicted. Such a result can only be expected from a rigid adherence to Ives' three-colour printing process, which, as already shewn in this journal (No. 20), cannot be made commercially successful. The work under review includes with its title the remark, "sixteen coloured soliographs," which must not be construed to mean coloured photographs produced by the process of photography alone. The principal block is a first-rate half-tone zinc block, with which are printed the colours from lithographic stones. It is certainly a happy combination, and renders unnecessary, to a considerable extent, the large initial cost of photographic colour blocks. The effects obtained are good; but, with this collection of views, embracing scenery in England, Italy, Switzerland, Germany, Egypt, Palestine, India, Canada, and the Yosemite Valley, it is easy to see that the depth of colour so suitable in one view is too deep for another. On the whole, this portfolio of "Famous Views" is very attractive, and with the not over critical public should command a wide circulation. It may be possible, by selecting a series of views more closely similar in colour, to produce a successful issue in every sense, and it is to be hoped that the unfailing enterprise of the *Strand* office will ultimately secure this object.

City and Guilds of London Examination in Lithography.

THE following is a complete list of the passes at the examination held on May 1st, as published on June 15th:—

No. 8860	R. Pemberton	1st class Honours.
No. 2992	A. Campbell	2nd class Honours.
No. 3763	C. J. Cousland	1st class Ordinary.
No. 3786	D. J. Wallace	1st class Ordinary.
No. 5963	F. Hurwitz	1st class Ordinary.
No. 3762	J. B. Hay	2nd class Ordinary.
No. 8855	F. Sedgeley	2nd class Ordinary.
No. 8865	A. Jones	2nd class Ordinary.
No. 8868	J. R. Wildman	2nd class Ordinary.
No. 8876	J. H. Milburn	2nd class Ordinary.
No. 10350	H. L. Dixon	2nd class Ordinary.
No. 10351	J. Tomlinson	2nd class Ordinary.
No. 10353	T. W. Jump	2nd class Ordinary.

In these lists the Nos. indicate the index No. upon the sheets of paper used for the answers.

It is very difficult to tell why the results are so bad, when compared with the set of questions. The questions were certainly good practical ones, although awkwardly worded sometimes. It is scarcely the duty of a technical examiner to set questions so that there is any doubt as to the real meaning of the questions themselves, but rather to endeavour to put the question most explicitly to find out what knowledge of the subject the candidate possesses. It seems probable that in time the examiner will see this, and try to bring himself to the level of those for whom he sets the questions, speaking to them through the questions in a plain familiar way, not liable to two constructions.

Chromo-Litho Printing.

If the task of the chromist is long and difficult, that of the printer requires as much knowledge and intelligence. A well conceived and executed drawing becomes a daub in the hands of an ignorant printer. The choice, the grinding, the use of colours, the harmony and vigour required at each working are indispensable conditions. For chromo impressions the presses and machines should be in perfect condition. The leather, the cloth, the blankets, the rollers, in a word, all the accessories made use of by the workman, should receive as much care as the work to be executed. *L'Imprimerie* truly adds that all depends upon the attention and methods of the printer, and upon the perfection of his tools.

Chromo-lithographs cannot be well printed unless the flesh side of the leather is turned inwards on the roller, thus allowing the rollers to be easily washed, and the colour rolled uniformly over large drawings. When the printer has finished his day's work, or when he perceives that the proofs are not clean, he should wash the stone with turpentine, roll it up in black, and clean it up where necessary before again rolling up in colour. The roller, the ink slab, the palette knife and the scraper should be clean. When the workman stops printing, let him remove with knife and scraper the remnants of colour on the roller, on the marble slab, or on the machine table; then pour a small quantity of turpentine on the marble. He should roll up and down in every way on the slab, so as to dilute the colour adhering to it (the roller), and, holding it perpendicularly with the marble, scrape it with the back of the knife in order to detach the liquefied colour. If a coloured tint remains on one of the rollers he should not hesitate to wash it again. Sometimes a mere vestige of a preceding colour will change the shade of a following one, and cause the loss of many proofs. Although it is possible to wash the rollers perfectly, it is better to have a special arrangement for the printings as follows: First, white; second, printing blue; third, yellow and size for gold bronzes; fourth, green; fifth, pink and flesh colour; sixth, red; seventh, neutral tints; eighth, dark brown or black. Each time that the roller is changed clean it with turpentine, benzine, or naphtha. If possible, use some five or six different rollers for different colours.

One of the chief merits of chromo-lithography consists in a simple means of preventing the stretching of the paper at the time of subsequent "pulls," and likewise in an infallible system of register. The first advantage is gained either in dry printing or where the sheets, previously moistened, are subjected to strong pressure under a press on the lithographic stone. Various modes of registering present themselves: first, with an etching point; second, with the aid of a reglet and two sewing needles, a method used for tinting backgrounds; third, by points in the printing presses; fourth, by means of a registering machine. Gauge well the keystone, which carries the outline of all the colours on the same sheet. The pressure operating by friction in lithography causes the paper to elongate more or less, because of the rubbing, the thickness and the consistency of the paper. Exactness of register is one of the most important means of preventing this movement. Many processes for this purpose are used; tools ingeniously made, of infallible precision, but somewhat complicated, for some workers. The paper may be sized or not—preferably the latter—and in order to obtain good results, especially on large surfaces, it should be calendered or carefully glazed. The impressions should be dry, because humidity destroys the brilliancy which is obtained by the glazing, and causes the paper to shrink. The paper should be of good quality, of even texture and perfect "colour."

A Different Kind of Art.

"What do you think of it?" asked the artist, as he exhibited his latest bit of work.

"Do you really want to know?" asked the critic, as if anxious to avoid giving pain.

"Yes," replied the artist, resolutely.

"You will not be offended if I speak frankly?"

"I will not."

"Then," said the critic, "I do not hesitate to say that it is the most diabolically hideous nightmare that I ever saw. In my opinion, it resembles nothing so much as a drunkard's vision."

"Is that your honest opinion?" asked the artist, as if loth to believe it.

"It is," replied the critic. "And what makes it worse is that you are capable of really good work."

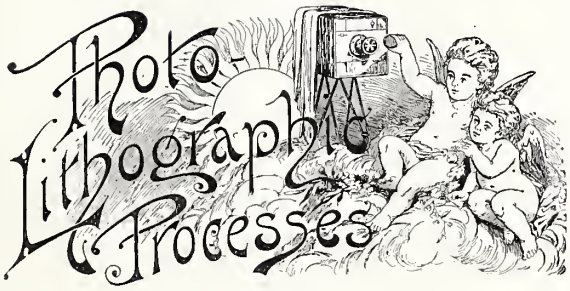
"I know it is out of my usual line and methods," admitted the artist, "but I thought—I thought——"

"Well?"

"Why, I thought I'd just try my hand at posters in view of the fad that——"

"Posters!" exclaimed the critic. "Let me look at that again." Then, after a critical examination: "My boy, it is sublime—superb! Your reputation is as good as made now. Why didn't you say 'posters' in the first place?"—*Geyer's Stationer.*

The Practical Photographer is an old friend of ours, and we know that the spirit of enterprise which characterises its production is widely appreciated. Even if this were not already the opinion of photographers of all grades, the "Child Studies Number" would suffice to make its reputation. This, the July issue, by a splendid series of illustrations, deals with a difficult branch of photographic work, and professional and amateur alike cannot fail to derive many ideas from the work of the artists instanced.



COLLOTYPE.

CHAPTER XXIII.

LEIMTYPE, WASH-OUT GELATINE, AND SWELLED GELATINE PROCESSES.

IMMEDIATELY following the collotype methods direct from the film, and the half-tone method by transfer to stone, is the collotype method known as leimtype, or Husnik's leimtypie. This is distinctly a collotype process, in which the print upon the film is so treated that it can be used in a letterpress machine along with the type, and printed at the same time.

For this process thick sheets or plates of glass are used, prepared as already described for collotype. When dried they are levelled in the drying box, and are ready to receive the sensitive gelatine. If any manipulator makes his own carbon tissue, then the same formula will do for this case. If, however, it is a new process to anyone, then the following gives good results :—

Nelson's transparent sheet gelatine	3½ ozs.
Sugar	1 oz.
Glycerine	100 grains (1-5th oz.)
Phenol	2 minims (2 drops).
Indian ink	2 grains (1-240th oz.)
Ammonia (·880)	60 minims (1 fluid drachm).
Bichromate of ammonium	300 grains (5-6th oz.)
Water	12 ozs.

The gelatine is soaked in 10 ozs. of the water ; the Indian ink in the remaining 2 ozs. By the application of heat as described for collotype jelly (see chapter XI., p. 125, vol. II. B.L.) the gelatine is reduced to a solution, and in that state the sugar, glycerine, phenol, and ammonia are added, and well stirred in. The solution of Indian ink is next added, and lastly the bichromate of ammonia is stirred in. This gelatine jelly is used in a quantity of about 5 to 6 ozs. to a square foot (½ oz. for quarter-plate photo.) The gelatine jelly having been spread evenly upon the plate, assisted in its running by a glass rod, the plates are then dried in a box, of much speedier action than the collotype drying box. The principle is to have currents of hot air passing through the chambers, and then passing over chloride of calcium, to free the air from the moisture. The heat in this box should not exceed 85° F. The chloride of calcium can be used over and over again, being dried between the times of use. The dried films are very sensitive to light, and must be kept in perfect darkness, wrapped in tinfoil to keep them dry. A simple and effective form of drying box made of tin has been used by Prof. Burton, and is recommended by him. It is made similar to photographic sensitive plate boxes, of a rectangular form, with a lid having a close-fitting rim reaching the bottom of the box. It is used thus : the calcium chloride is well heated and put into the box. The box is closed and left to cool. When cool, the chloride is spread out to a depth of half-inch and no less. In each corner is placed a cork, standing just clear of the calcium at its top ; upon these four corks the plate with the gelatine jelly (set) is turned over face downwards and left to dry. The lid is put on ; the box is put in a place where the heat is 80° F., and there left for twenty-four hours, when it will dry. It may be left there until wanted for use, at least to the extent of ten days. This method of drying has the recommendation of being free from dust and light, and may be made into a safe means of storage, if further protected by making the boxes airtight by some outside covering.

When required, these plates are exposed under the negative, and timed as for collotype. Then the back of the film is exposed through the glass to harden it. The exposed film is now soaked in cold water, and the picture is developed by brushing over the surface cold saturated solution of bichromate of potassium, which will not soften the exposed parts. In due course the bichromate of ammonium of the unexposed gelatine washes out, leaving the work itself solid on the film. This state is not arrived at directly, but by taking the film out of the developer and drying it, without washing ; then cover it with printing ink dissolved in turpentine ; finally hardening the whole work by a short exposure in sunlight. It is then returned to the developer, and gradually worked up to a stage of sufficient hardness (by the bichromate) and depth to withstand working in a letterpress machine.

It may be easy to use a glass plate mounted to be type-high, but it is scarcely as desirable as a metal plate. Therefore the original film may be put on a metal plate instead of on a glass, and worked up in exactly the same way as described for the glass plate. Or by waxing the glass plate previously, as already described for stripping films (chapter XVIII. pp. 109, 135 and 188, vol. III. ; p. 15, vol. IV.), the tissue may be prepared on glass, and at the finish stripped and mounted upon metal plates, as is done in the heliotype process.

Leimtype has not become a commercial success, although at one time as many as two thousand impressions were easily taken from such blocks. It has been stated that thirty-two thousand impressions were taken from one block. It has now given place to the half-tone zinc-block process.

WASH-OUT GELATINE PROCESS.

This process of leimtype contains the elements of the wash-out gelatine process, from which the leimtype block may be prepared by a slight variation in final treatment.

The wash-out process consists in using a gelatine which can be rendered readily soluble, and such may be prepared from :—

Glue	3 lbs.
Ammonia	5 ozs.
or	
Hydrochloric acid	1 oz.
Treacle	5 ozs.
Water	10 ,,
Bichromate of potassium (in fine powder)	3 ,,

These ingredients are compounded by soaking the glue in cold water, changing the water occasionally to free the glue from all soluble matters and other impurities. The glue swells to a considerable extent, and should be drained free from water before putting it into a pan, and by placing the pan in hot water, raising its temperature to 200° F. (93° C.) At that heat the glue melts. When melted the ammonia or acid is added, and for the next few days—sometimes six days will be necessary—the heat must be maintained at 200° F. until the setting property of the glue is destroyed. At this stage add the remaining materials, viz., treacle, water, and bichromate, and finally strain well through muslin. This solution is now ready to coat upon the plates. The glass plates are prepared for the gelatine film by well washing after treatment with dilute nitric acid. They then receive a substratum of gelatine, 1 oz. ; water, 10 ozs. ; bichromate of potass., 15 grains. This is dried and exposed for an hour or two, to thoroughly harden. The plate with the substratum is levelled in the drying box, coated with the glue solution to as large an extent as possible without running over the edges. Then the box is closed and the heat raised to about 80° F. (27° C.), whilst the drying takes place during the next three to six or even ten hours. When dry the film is sensitive and ready for exposure under the negative. The exposure is conducted in similar frames to collotype films, and timed in the same way. The exposure may require half an hour in sunlight. After exposure immerse in cold water for a quarter of an hour, followed by an immersion of several hours in a bath of water at 100° F. (38° C.), allowing the plate to stand in a vertical or oblique position. During this development all the soluble glue should be washed out, leaving the image only supported upon the substratum of gelatine. From this developing bath the plate is at once put into a hardening bath of alum for a quarter of an hour. Then give it a rinse in cold water, dab it dry, and run oil all over it to assist in the ready separation of the cast. All surplus oil is run out, and a thin paste of good plaster of Paris is run into this glue die. The back is smoothed, and allowed to set for two hours. The die having been oiled will allow the plaster cast to be lifted away. From this cast, when covered with plumbago, an electrotype may be taken which will give the necessary printing block.

As pointed out at the commencement, this process will also give leimtype blocks, for if the whole process be carried out upon a metal plate, instead of glass, then the die, from which the plaster cast is taken, would equally serve the purpose of a printer's block. The metal plate would require mounting on wood to make it type high for letterpress printing.

THE SWELLED GELATINE PROCESS.

The foregoing processes shew what has been done to adapt actual collotype to the type machine, and the production of type blocks from another variety of collotype. The swelled gelatine process is another variety of collotype from which blocks can be prepared in line and half-tone. The process, although quite practicable, is yet of such a character as to place it outside the ordinary commercial sphere when brought into competition with zinc blocks in line and half-tone and collotype direct with collotype transfers to stone.

The process is carried out much the same as collotype. In the first place, thoroughly clean plates are coated with enamel collodion and allowed to dry. Upon this substratum is poured the gelatine film, consisting of :—

Nelson's amber gelatine or Creutz's middle hard gelatine	4 ozs.
Water	15 ,,
Sugar	1 oz.
Chrome alum	10 drops (1-6th drachm)

The gelatine is soaked first in the water (cold). Then it is all raised in temperature until a gelatine solution is formed, into which the other two ingredients are well mixed. The whole is well strained through muslin. Take of this warm solution 3 ozs. for every area of plate equal to 12 × 10-in. (120 sq. ins.), and pour upon the plate. Level the plate carefully and allow to dry in a current of clear air. When dry, these plates may be kept in a dry dark place for a considerable time. The sensitising of these films may be performed just prior to exposure by immersing the plate and film in a solution of :—

For Line Work.

Bichromate of potassium	1 oz.
Water	15 ozs.
Methylated spirit	5 ,,

For Half-tone Work.

Bichromate of potassium	1 oz.
Water	15 ozs.
Ferricyanide of potassium	240 grains (½ oz.)

The immersion may be continued for five minutes, when the plates are removed and dried in the dark. For half-tone work the plate must be dried at 120° F. (48·8° C.) to assist the ferricyanide to give a grain by crystallisation. When dry, expose under a negative. Line work should be fully exposed in

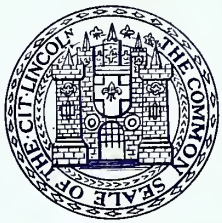
The Arms of the Towns and Counties of Great Britain.

Containing various points of note for the artist on the Art of Blazon.

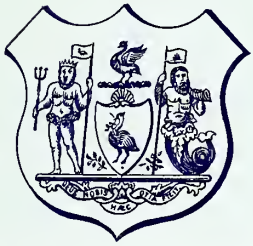
Launceston.

Leominster.

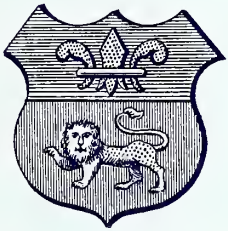
Lincoln City.



Liverpool.



Lancashire.



Norfolk.

Maidstone.

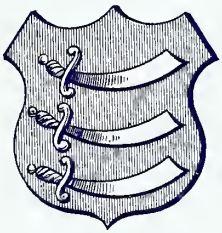
Malmesbury.

Manchester.

Monmouthshire.

Montgomery.

Middlesex.



four hours, so that the work shews through to the back of the plate. The half-tone needs but a shorter exposure. When taken from the printing frame, the plates are immersed in cold water. The cold water will cause the unexposed film to swell, the picture being left in intaglio. The swelled gelatine is next hardened by immersion for five minutes in a solution of:—

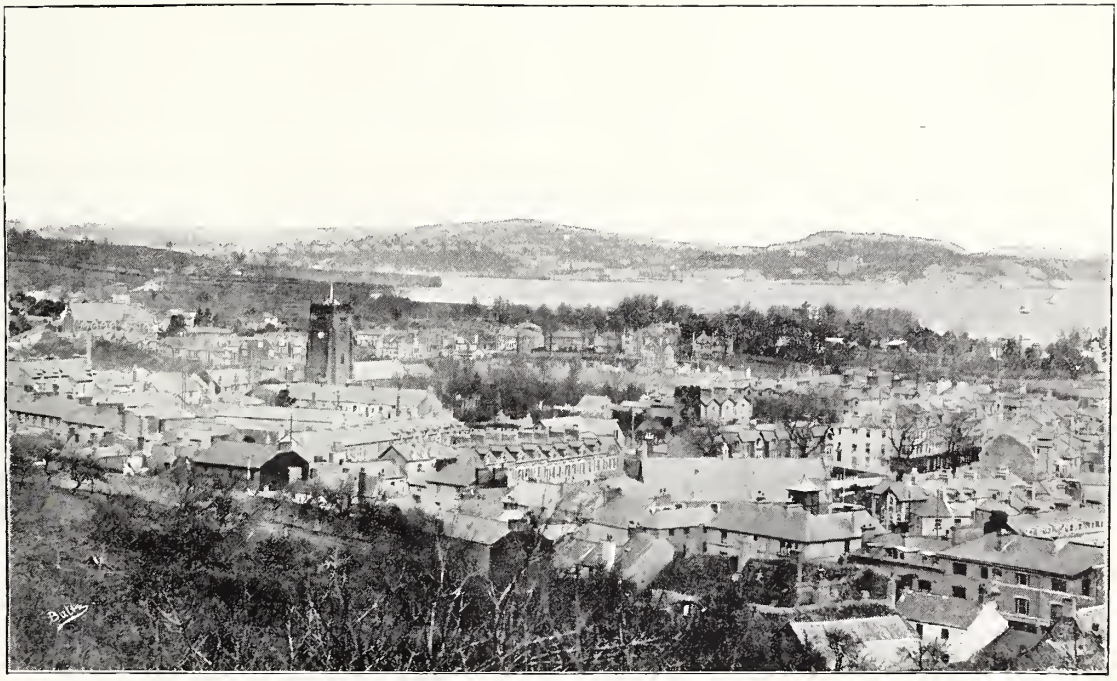
Tannic acid	1 oz.
Methylated spirit	20 ozs.

Then the plate is removed, dabbed surface dry with a soft rag, and oil run into it to prevent the plaster sticking. The quantity of oil must be small, being only sufficient to form a mere film on the gelatine. The plaster of Paris paste is prepared rather thinner than for any quick-setting purposes, but not so thin that it will not set. To obtain this latter state, it takes about half an hour, stirring and adding water, so that a quarter of an hour's stirring and diluting should generally give a nice thin paste, which will flow down into every crevice of the mould. Having filled the mould, smooth the back and leave it to dry for two hours. When the plaster is first put on, use a camel-hair brush, or any fine needle, to pierce the plaster all over to allow the escape of air bubbles. When dry, force away the plaster cast, and place it in water until it is evenly moist. Then remove it, and at once pour into it melted wax. The wax may be coloured, if desired, with plumbago, which assists in the next process of electrotyping. Or the plumbago may be dusted on the wax, before electrotyping. The final preparations for electrotyping may be left to the electrotyper.

The foregoing process is one which Mr. W. T. Wilkinson recommends upon his own practice, and is of more recent date than the process recommended by Mr. T. Bolas, F.C.S., in 1878-9. This latter process is valuable as one of the steps upon which the photo-mechanical processes have risen, and shews the difficulties then encountered with the mode of surmounting them. He apparently prepared his own sheets of gelatine by soaking:—

Soft gelatine	1 part.
Water	5 parts.

Then pouring this gelatine solution upon a glass plate which had been waxed upon its face, and had a wax rim built all round to prevent any overflow. The gelatine film, about one-fifth inch thick, dried on the glass, from which it was readily lifted for use. However, sheets of gelatine were obtainable then as now, and are more highly recommended. Such a sheet of gelatine was prepared and made sensitive by soaking it, until flaccid, in a solution of 3½ per cent. potassium bichromate. It was then squeezed upon a waxed glass, to remove all surplus potass bichromate, and dried in a warm dark place, as it is then sensitive



By permission of Mr. W. A. Axworthy, Paignton. *Photo by Bultz.*

PAIGNTON, LOOKING TOWARDS TORQUAY.

to all light, except orange or red. When dry, the sensitive film was stripped from the glass and exposed under a negative for about twenty minutes in sunshine, or longer in the shade.

When the picture had printed, the sheet of gelatine was placed in cold water, where, in the course of several hours, the unexposed gelatine swelled, leaving the picture in intaglio. Then the gelatine was placed on a sheet of glass, squeezed down gently, dabbed surface dry, and a little oil distributed evenly all over the face, so as to assist the plaster of Paris to leave it more readily. The moderately thin solution of plaster of Paris was next run in, to about one inch thick; whilst drying it was frequently pierced with a brush to release any air bubbles, and finally it was smoothed off at the back. Already it will have been noticed that the film was put on a glass and taken off again, only to be put back at a later stage. Now, however, the glass plate was again slid off the gelatine, and the gelatine stripped up from one corner from the plaster cast. This cast was next put in water, and raised to 120°F. (48·8°C.), when it was removed and immediately filled with stearine, which would melt into it, or it might be applied melted. The stearine cast would soon harden, and could be removed from the plaster. The stearine was then dusted with bronze powder—electrotypers' bronze powder for preference—and placed in the electrotypers' bath, where a layer of metal was deposited until sufficiently thick; it was filled up with molten type metal, and mounted on wood for printing in the letterpress.

The same remarks apply to this process as to the preceding one, namely, that the results are not perfect, and do not compare favourably with half-tone zinc block etchings. It is possible that the process will undergo some improvements as years roll on, and it may ultimately become one of the leading photo-mechanical printing methods of the day.

It is announced that a Company has been formed to work "Fensketype," a collotype process discovered by Mr. Emil Fenske. The invention is said to be an ingenious method of manipulating the ordinary commercial dry plate in such a manner that a photograph can be taken, and by the new process a plate prepared within two hours, from which an unlimited number of impressions in ordinary printers' ink can be produced.

Henry H. Bemrose, Esq., the new M.P. for Derby, shews his practical sympathy with ailing printerdom in the following letter to the secretary: "I have pleasure in enclosing cheque for ten pounds for the Caxton Convalescent Home. I know no institutions which confer greater benefits than do homes of this character, and am glad the printers are to have one."

A School of Photography.

The advantages of possessing in this country parallel institutions to the Vienna and Berlin schools, which specially provide instruction in photography and its various applications, have been so often enumerated, that it was felt to be but a question of time before this educational weapon against foreign competition should become *un fait accompli*. The 1894-5 report of the Technical Education Board of the London County Council shews that representations have had the desired effect, and action may be taken much sooner than the promoters hoped for. The report referred to contains the following note:—

"The establishment of a school of practical photography as applied to the various reproductive processes, some of which have of late years almost taken the place of wood engraving, and which include photo-lithography, collotype, photogravure, half-tone etching, Meisenbach blocks, photochrome, etc., has been receiving the very serious attention of the Board. It seems that some of these processes are carried to a much higher degree of perfection in Vienna, Paris, and Berlin than in London, and that in those cases in which London firms have been successful in competing with Continental houses many of the skilled workmen are foreigners. Several applications have been made to the Technical Education Board by wood engravers and photographers for assistance to enable them to obtain practical instruction in some of the above-named processes, and it is probable that by maintaining a really first-class school of 'process work,' the Board would be able to exert an immediate and direct effect on an important industry, and to benefit a large class of skilled workers. The Board has accordingly consulted Captain W. de W. Abney, C.B., F.R.S., and other experts, with a view to ascertaining the best method of procedure, in order to maintain an efficient school of practical photography, and the reports which have been submitted are receiving the very careful attention of the Board. The chief difficulties lie in the scarcity of suitable teachers, and in the great expense which an efficient school carrying out all the above branches of work would involve, but if the school were successful in attaining its object a very large annual outlay would be well expended."

Doubtless, the London Technical Education Board is the proper body to take this matter in hand, and having the funds at its disposal can easily arrange for an experimental venture.

With regard to the possibility, often discussed, of printing intaglio plates by machine power, we find that a machine for this purpose is already made in Paris by M. Voirin, and is especially built for printing cheques and other commercial work.

Technicalities.

WHO says "proofing"? Surely not the erudite, nor anyone knowing what the word means before using it. Is there such a recognised word in the English language? If so, where is it to be found? There are two trades in which the word is actually in use, and in which it has such a definite meaning, that it is a technicality of those trades. In the hatting trade, the cheapest felt hats contain as little wool and hair as possible, whilst their hardness depends on the amount of "proofing" introduced. The "proofing" is a shellac solution which binds the materials together, and gives a "finish" to the hat, just as a size or enamel gives a "finish" to paper. In the waterproof garment trade the cloth has to be "proofed" or "waterproofed," and this "waterproofing" consists in saturating the fabric with a solution of india-rubber to make it proof against water, just as the bullet-proof coat is proof against bullets. But how differently is the word used in the printing business. The word "proof" is a substantive, and like the words hoof and roof takes "s" to form its plural, proofs. But the verb of this substantive is not "proof." It is "prove," and like "move" the present participle becomes "proving," which is a correct English word.

Taking the dictum of the greatest English dictionary extant (Cassell's Encyclopædia, containing 150,000 words in seven vols. of 770 pages each), the word is set forth as a substantive as "proof" with the obsolete spellings of "preove," "preef," "preve," "profe," "preife," "proofe." The leading definition being:—"Ordinary language, a test, a trial." *"Put it in proof"* (Shakespeare—King Lear, iv. 6).

"That which serves to prove, try, or test anything; that which serves as evidence; that which proves or establishes any truth or fact; that evidence which is sufficient to satisfy the mind of the certainty of the truth of a fact, statement, or proposition."

"By proof, meaning such arguments from experience as leave no room for doubt or opposition" (Hume, on the Understanding, §6, *note*).

"The state of being proved, tried, or tested, and having stood the test."

Technically.—"1. Engraving: (1) an impression taken from a steel or copper plate in the course of execution, to determine its forwardness; (2) an early impression of a completed plate before printing the regular edition." "2. Print: first proof; revise."

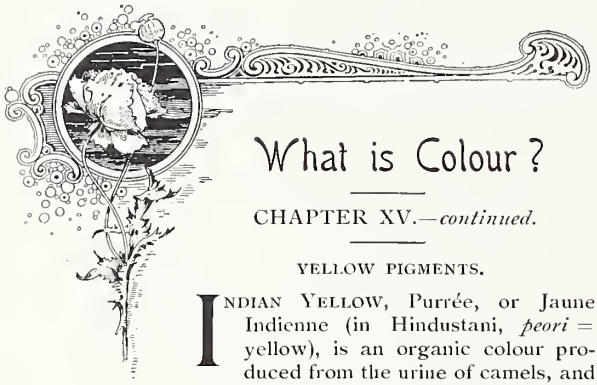
The definition is then continued in its adjectival sense, as applied to proof spirit, proof charge, etc. It is not used in any sense as a verb. Examining various passages, in other definitions, "proving" is always spelt "proving," and not a single instance occurs of its spelling as "proofing."

In reference to the verb, the same dictionary sets forth:—"Prove" with its obsolete spellings, preeve, preoven, preve, prieve; and in defining the word, goes on:—"Ordinary language, 1. To test or try by an experiment in order to ascertain the quality of, according to a certain standard; to make a trial; to bring to the test. To demonstrate. To make a trial; to try; to essay. To make certain; to have or attain certain proof or demonstration." There are many other definitions on different matters not appertaining to our technicality. The same dictionary then sets forth:—"Proving" with its obsolete spellings, preeving, preving, prevying, and defines it as the present participle of the verb to prove; adding a definition of it in the sense of a substantive: as "the act of one who proves, tries, or ascertains; the act of trying, ascertaining, or demonstrating; proof, trial; an experiment to test or ascertain the strength of anything."

In defining "first proof," it states it to be "the first rough impression taken for correction," and "revise" as "the second proof," etc.

With such clear explanations before the trade, is it justifiable to introduce a new word such as "proofing" into the trade?—a word which is not correct English, and above all is not necessary, because we already use the word "proving" in its true sense, and it conveys the fullest possible meaning. It may be argued that it is a technicality of the trade; but that is incorrect, as it is a technicality of two other trades, and has a widely different meaning. It is only of recent use, due possibly to some carelessness, or to some individual who thought he had found out something smart, just the same as the vulgar use of the word "dollar" to designate a five shilling piece. Such a usage is absolutely incorrect, since we have a four shilling piece, which should be, if anything, the correct coin to be called a dollar. It is common to hear persons plead usage as the excuse for using a "new" word, and it seems in these days of the "new" woman, that the "old" man may do as he likes with the language, and plead usage as an excuse for ignorance. It must not be forgotten that language is a science as well as chemistry, and it is just as much ignorance in the one as in the other to use terms which are inapplicable. Such misuse reminds one of Mrs. Malaprop, who used any word which sounded "big," regardless of its meaning.

Misuse of words frequently arises by error, and rather than submit to correction, some men will persist in errors, and either become a laughing-stock to those of better intelligence, or the admiration and wonder of the less intellectual who follow in their footsteps on account of the evidences of "originality" (?).



What is Colour?

CHAPTER XV.—*continued.*

YELLOW PIGMENTS.

INDIAN YELLOW, Purrée, or Jaune Indienne (in Hindustani, *peori* = yellow), is an organic colour produced from the urine of camels, and imported into this country in the form of fœtid balls (of brownish appearance outside, but deep orange yellow within) from India, where it has been in use for a long period. It is also said to be prepared from the urine of elephants and buffaloes, and imported from China as well as the East Indies. Besides the organic constituents, there are compounds of magnesia and alumina, in combination with an organic acid. In preparing the pigment, the brightest lumps are selected and washed to excess in water.

Indian yellow is distinctly a deep rich yellow. It is manufactured as a water-colour and oil-colour pigment, and as a lithographic and letterpress printing ink (at about five to six times the price of chrome yellow) by Manders, Winsor & Newton, Fleming & Co., Berger & Wirth, and probably others.

Indian yellow is a pigment of good body, therefore opaque, and as a water or oil colour it withstands at least six months' ordinary daylight and sunlight exposure. Its reputation in India is based on its sun-resisting quality. In working as an ink it requires to be ground in stiff varnish, and a moderate addition of driers to be made. Ten years ago this pigment was not considered suitable as a printing ink, but the method of manufacture has so much improved that it has become a standard article in the ink-maker's list.

YELLOW LAKE, PERSIAN YELLOW, or DROP YELLOW, is an organic product from the juices of various species of the dyers' buckthorn (rhamnus), viz., *rhamnus infectorius, saxatilis,* and *amygdalinus,* known as Avignon, Persian, French, and Turkey berries. It is also prepared from quercitron (*quercus tinctoria,* a species of oak) bark, the same as used in America for tanning, by one at least of the largest ink makers. Other yellow lakes are prepared for paper stainers from a mignonette or weld, and the yellow wood of New South Wales. The turmeric tree (a ruewort) of Australia yields a fine yellow from its inner bark.

The manufacture of the colouring matter may be best illustrated by the following recipes :—

Persian berries, or quercitron bark or turmeric bark	1 lb.
Cream of tartar	1 oz.
Water	1 gall.

Boil till reduced to one-half, strain, and precipitate the yellow by solution of alum. Finally strain off and dry.

Either dyestuff (as above)	1 lb.
Alum	½ ,,
Water	1 gall.

Boil thoroughly, and finally precipitate the yellow by solution of potassium carbonate. It is probable that these berries are used before being ripe to produce the yellow; for when ripe, the juice of the Persian berry mixed with alum gives the painters' sap-green.

The quercitron bark should be well boiled, and treated with dilute hydrochloric acid to liberate quercetin from the base of the colouring matter, known as quercitrin ($C_{33}H_{30}O_{17}$). This is a yellow crystallisable liquid, neutral, bitter, and without odour. This solution will yield green when added to ferric chloride (Fe_2Cl_6), and if evaporated to dryness, or allowed to crystallise, then heated to 160° F. (71° C.) it melts into a dark yellow resin.

The Persian yellow or yellow lake pigment has most frequently been prepared for commerce in tears or drops, and has therefore received the name of drop yellow. As will be seen by the recipes, it is precipitated by alum, and in its constitution is therefore like other lakes from organic origin. As a colouring matter or printing ink, the following different shades may be enumerated :—

TABLE OF PERSIAN YELLOW PRINTING INKS.

Berger and Wirth's	Other Manufacturers' Inks.	Description of the Colour.
.. .. ..	Winsor & Newton's yellow lake	Being the palest possible orange yellow.
No. 1036		
,, 1007		
,, 1014	= Manders' yellow lake (No. 0754)	Resembling Manders' lemon chrome turned slightly orange.
.. .. ..	B. Winstone's yellow lake.	
.. .. ..	F. Horsell's light yellow lake (No. 722).	
,, 1038		Resembling Winsor & Newton's deep cadmium yellow turned slightly orange.
,, 185		
,, 1018		Being yellower than Winsor and Newton's orange chrome.
.. .. ..	F. Horsell's deep yellow lake (No. 720).	
,, 191	(Persian yellow)	Being of the same brilliant cast as Manders' geranium (0548), but more orange.

The above eleven shades are arranged from the palest at the top to the deepest at the bottom. It will be noticed that several makers' inks have no equivalent in Berger & Wirth's list, and *vice versâ*. The numbers attached to inks are the makers' list numbers, by which they may be ordered.

The variety of tones resulting from the different materials used thus place eleven different inks on the market, and it is only by experience that any

user can decide which suits him best. The pigment is transparent, beautifully brilliant, and, according to F. Horsell & Co., may be varnished. F. Horsell and Co. consider their inks as fast colours. G. Rowney & Co. make it very fugitive as a water-colour, but more permanent in oil. Winsor and Newton's printing ink is quoted as fugitive, but standing fairly well under ordinary conditions. It may, therefore, be used for book illustrations, and such other work as is only temporarily exposed. Impure air does not injure the colour.

This pigment, being so transparent, when ground in varnish appears in the mass a brown, but immediately it is printed in thin tints on paper the brilliance appears. It is always best used alone, or for making transparent green. It is difficult to get its full value as a yellow when mixed with the iron blues, being at once darkened. Whilst in tints, with lead (white) or other metallic pigments, it loses its fulness of colour. It requires a fair amount of driers, and must be ground in stiff varnish.

YELLOW OCHRES.—(Gr. *ōchra* = yellow ochre), OXFORD OCHRE or CHROME, STONE OCHRE, BROWN OCHRE. In the briefest description, yellow ochre is a clay coloured by an admixture of oxide of iron, finally ground to form a pigment. The term ochre is applied indiscriminately to metallic oxides occurring in an earthy form, such as iron or red ochre. These ochres are the selection from all the best beds. Some of the finest are near Oxford. Others are brought from France. These best ochres are soft and smooth as soapstone.

The exact nature of each coloured ochre is hard to determine, seeing that the constituents of the original material are likely to be so different. One of the earths is brown ochre, which is distinguished as the ochreous or earthy variety of limonite, limonite itself being a hydrated sesquioxide of iron. This limonite was probably formed by a slow alteration of other iron ores, or other metals containing protoxide of iron. The brown ochre varies in colour from yellow to brownish red. Again, red hæmatite, or specular iron ore, occurs naturally in clays; its composition is practically the same as limonite. The hydrated ferric oxide occurs as brown hæmatite. This shews that the main compound of iron in the yellow ochres is ferric oxide (Fe_2O_3), known also as peroxide of iron, sesquioxide of iron, red oxide of iron, rouge and colcothar, which is combined (or mechanically mixed) with clay. Clay itself is simply a heterogeneous mixture, as might be expected from its mode of production. It may be looked upon as all the very finest particles of everything which can be broken up and carried in suspension by a stream or other volume of water, and ultimately deposited as a fine mud, which gradually becomes the semi-hardened mass known as clay. In the main, clay may be considered as a hydrous silicate of aluminium [$Al_2O_3 2(SiO_2) 2(H_2O)$], containing much free silica, calcium carbonate, calcium sulphate, oxide of iron, magnesium carbonate, and small quantities of alkaline salts, phosphates and iron pyrites. It is by pulverising such a complex body, and well washing it, that the various ochres are obtained, the colour of which varies according to the different constitutions of clay. The latter depends upon the different localities in which it has been formed.

The yellow ochres may be considered quite neutral in their general action upon the majority of pigments. Naples yellow and Persian yellow would, however, both darken it somewhat, because they would themselves darken in contact with the iron of the ochre.

Yellow ochre is a low-toned yellow—not by any means an unpleasant tone. It is if anything a brownish yellow, with a fleshy or pink shade. It is not a really transparent pigment, like the cochineal lakes, but stands midway as a good semi-transparent pigment. Its transparency is useful in the formation of good green effects when mixed with blue—Prussian blue. Ochres are all permanent and capable of being varnished. Yellow ochre makes good tints in varnish, but its transparency and low tone prevent its full colour coming out; it is lost in the thinness of the film.

Yellow ochre in the dry state requires 75 parts varnish to every 100 parts of pigment to make it into a printing ink. Being fairly transparent, it need not be printed as the first printing unless desired. It can be printed at any time, and can be used to brighten browns, and for certain brownish flesh tones. It is useful in stone work and low-toned tree greens.

Yellow ochre and white make a fine pale brown of a warm tone.
" " cobalt make a distinct bluish-green.
" " indigo make a deep, almost olive-green.
" " rose-madder make only a reddish-orange.
" " vermilion make a brighter red.
" cobalt, and rose-madder make a useful bluish-grey.

These are but a few of the useful compound colours which can be made with the use of yellow ochre. As an ink it requires little or no driers.

The inks manufactured are :—

TABLE OF YELLOW OCHRE PRINTING INKS.

Berger & Wirth's.	Other Manufacturers' Inks.	Description of the Colour.
No. 1 ochre (208)	.. ..	pale pinkish-brown.
No. 2 " (209)	.. ..	slightly yellower, or browner than No. 1.
.. ..	Manders' golden ochre	golden brown.
No. 3 " (210)	= Winsor & Newton's yellow ochre	bright brown, or yellow ochre.
Roman " (214)	.. ..	paler yellowish-brown.
No. 4 " (212)	.. ..	deep fleshy yellow.
No. 5 " (213)	.. ..	fleshy yellow.

These inks are arranged from the brownish tones at the top to the yellower tones at the bottom.

Berger & Wirth have another ink (1003) called flesh colour ochre, which is much pinker than their No. 5 ochre, and much paler than their No. 1 ochre.

Engraving: Wood or Process.

VARIOUS authorities in the art world who ought to know—or know better—have expressed faith in a coming good time for wood engraving, and exponents of the art devoutly hope the prophesied return tide may be already flowing, fraught with all the joys of permanent and lucrative employment. It is, however, more than doubtful if an apparent return to wood engraving would bring success on the former lines; for the restless "process" worker may not now be superseded, more especially as his work becomes less and less open to criticism. We put this in order before any change of taste, for there is no doubt that the exigencies of modern illustration and commercial art have given birth to "process."

The growth of newer methods of engraving has induced many comparisons between the results attained by the worker on wood and the photo-process exponent; but while certain illustrations by both arts are excellent and satisfactory as reproductions, yet general taste is decidedly in favour of the photo-process work. Apropos of the subject, *Wilson's Photographic Magazine*, in recently discussing the subject of "Wood Engraving *versus* Half-Tone Engraving," illustrated by blocks prepared by both processes, brings to the fore the work of the artist. The objection to photo-engravings as "perpetuating small excrescences and defects which may sometimes be found on even the most valuable negatives" is surely not sustained, especially when the artist copying the originals is allowed to make sundry alterations, as his taste demands. In this instance it might be claimed from the example shewn that the superiority of any of the wood engravings is not so much due to the engraver as to the artistic taste which prepared the picture from the photograph. The process of producing wood engravings for best magazine illustrations is somewhat as follows:—A large drawing is made in wash or India ink. This is photographed the size of the desired engraving upon wood. The engraver then works upon the photograph—not the drawing—printed on the wood. From this may be inferred the actual work of the engraver.

Sir William Ingram, the Director of *The Illustrated London News*, has stated that he thinks there is a good time coming for artists, and that there will arise a new school, who will be required to compose drawings from photographs. These photographs may be portraits or photographs of events. This would not cause the former demand for wood engraving to revive at once, as in many cases these original drawings would be reproduced by what is called the etching process. He further expresses an intention of introducing into the pages of the *News* more wood engravings than have appeared for some time past.

This again indicates a tendency *to prepare subjects* rather than to put new work into the actual block, whether by hand or photo process, and makes the balance still further incline towards the "process." It is said even now that the public—that omniscient power, the great B.P.—is becoming tired of photographs, and that artists will ere long have splendid chances. These chances evidently are to lie in the direction of preparing originals—photographs or drawings—to allow for best reproduction, and here the true artist can display insight and taste to the fullest degree. It necessitates a marvellously educated eye and a wonderfully delicate hand to grasp the essential lines of a picture from a general view, detailed sketch, or photograph, and in this direction the skilled wood engraver has an opportunity even beyond his non-engraving artist brethren. We hear it said, too, that our great employer—the B.P.—is becoming fond of coloured pictures, and, like a certain famous cartoon subject, will not be happy until he gets it; and not chromo-lithographs in ten colours, produced in as many days or weeks, but colour pictures quickly obtained and rapidly printed for daily use. This is quite within the bounds of probability, and artists must lead the way again, whilst printers will profit in similar degree by seconding their efforts at the press.

Anyhow, whatever may be coming, and progressive or retro-active as is the outlet, it behoves all to prepare for producing better work in a shorter time and at a low rate—or, well—prepare for extinction.

Process Work hears from many quarters that the big lithographic houses have suffered most seriously during the past year or two, and if the story could be told and illustrated by plain figures it would be a little astonishing. This may scarcely be set down to process work, for although colour departments appear to have been most affected, photo-chromotype is scarcely sufficiently advanced to account for the deficiency. It is quite true that although many houses have done well of late, some even reporting increased business, yet there is no gainsaying the evidences of trade societies, of unemployed workmen, and of supply houses. Public taste may be the cause of a decline in lithographic productions, and to this may be added the effects of foreign competition and rival processes, but there is still the indefinable unknown quantity—the minus x so variously accounted for by educationalists and would-be reformers.

WITH reference to the International Exhibition of Lithography to be opened in Paris on August 15th, this year, it is possible that the Russian trade may be represented, the Minister of Finance having addressed a circular letter to the more important lithographers in Russia, inviting them to take part in the forthcoming celebration.

General Trade Report.

As the summer months proceed there is less and less employment for printers. The momentary impulse given by the elections for a week or ten days taxed the energies of the trade, and naturally threw other orders somewhat behind. There was, however, a rapid recovery, and general business has assumed its ordinary standard. The returns of the unemployed shew that trade is better than last year. Thus, the number of unemployed for each month is represented by the following percentages:—

Dec.		Jan.	Feb.	Mar.	Apl.	May.	June.
1894 ..	4·5	1895 ..	5·3	4·8	4·9	5·4	5·6	5·5
1893 ..	6·1	1894 ..	6·1	5·8	4·2	5·0	6·0	6·4

It was only in May and June that the trade shewed a distinct improvement upon 1894. Last year may be considered one of the worst on record, whilst Dec., 1894, Jan. and Feb., 1895, were certainly the three worst months for many years. The following tabulation shews the general returns of unemployed artisans:—

	No. of Societies making returns.	Total No. of Members.	Total No. of Unemployed.	1895 Percentage Unemployed.	1894 Percentage Unemployed.
Dec., 1894 ..	67 ..	367,796 ..	28,484 ..	7·7 (1894) ..	7·9 (1893)
Jan., 1895 ..	76 ..	370,335 ..	30,433 ..	8·2 ..	7·0
Feb., ,, ..	84 ..	385,594 ..	30,624 ..	7·9 ..	6·3
Mar., ,, ..	83 ..	387,907 ..	25,146 ..	6·5 ..	6·5
April, ,, ..	84 ..	386,627 ..	25,174 ..	6·5 ..	6·1
May, ,, ..	85 ..	387,411 ..	23,351 ..	6·0 ..	6·3
June, ,, ..	86 ..	391,371 ..	21,964 ..	5·6 ..	6·3

These figures shew that some trades are worse off than our own, and probably some are much better employed. The fact remains that there are 5 to 6 per cent. of our trade constantly unemployed, proving that there is at present no room for new labour, since many of the present craftsmen cannot find employment.

The serious state of our foreign trade, caused by the ice blockade of the ports during February and March, has almost righted itself. The imports for the six months to June 30th shew a decrease of 3·5 per cent., mostly in food, drink, tobacco, and druggists' commodities; raw materials, manufactured articles, metals, and miscellaneous articles shewing about the same as last year. On the other hand, the exports for the six months ending June 30th are only ·7 per cent. less than for the first six months of 1894.

Gauging trade from the pauper statistics, the following table shews the average number of paupers relieved each day in each month:—

	No. of Paupers relieved on one day in		No. per 10,000 of the Population.
Dec.,	1894 ..	335,634	229
Jan.,	1895 ..	352,637	241
Feb.,	,, ..	406,381	278
Mar.,	,, ..	384,401	264
April,	,, ..	343,688	235
May,	,, ..	328,189	224
June,	,, ..	322,654	220

These figures shew nearly 80,000 less paupers in June than in Feb., and the previous figures shew nearly 9,000 less unemployed. Much of this depends upon the weather.

The following brief reports shew the condition of the printing trade in various parts of the country:—

ABERDEEN.—Letterpress slack, 7·5 per cent. unemployed. Lithography improving. Bookbinding moderate.
ACCRINGTON.—Printing trade still fairly employed.
BELFAST.—Letterpress dull. Litho artists and bookbinding fair. Litho printers moderate. The four societies, with 792 members, have 46 unemployed, or 5·8 per cent.
BARROW.—The whole trade is only moderate.
BIRMINGHAM.—Letterpress bad, 8·6 per cent. unemployed.
BOLTON.—Printing trade much as usual—moderately employed.
BRADFORD.—All the trade steadily employed.
BRISTOL.—Letterpress 3·7 per cent. unemployed (at Bath 10 per cent.) Lithography fully employed. Bookbinding quiet.
CARDIFF.—Printing trade generally dull. Bookbinding moderate.
CARLISLE.—Printing trade maintains its usual good employment.
CORK.—Printing trade generally steadily employed.
DERBY.—Printing trade generally improved.
DUBLIN.—Letterpress bad, 20 per cent. increase of unemployed. Lithography and bookbinding quiet.
DUNDEE.—Letterpress good, only 2 per cent. unemployed. Lithography and bookbinding fair.
EDINBURGH.—Lithography, printers and artists well employed. Bookbinding moderate. Letterpress not at all improved.
GLASGOW.—Lithography declining, 4 per cent. unemployed. Letterpress still slack, with 6 per cent. unemployed.
HANLEY.—Letterpress improving, with 6 per cent. unemployed. Other branches of the trade only very quiet.
HULL.—Letterpress moderate, 5 per cent. unemployed. Lithography moderate.
IPSWICH.—Letterpress slack. Lithography moderate.
LEEDS.—Printing trades moderately employed.
LEICESTER.—Letterpress slack. Bookbinding moderate. Lithography fully employed.
LIVERPOOL.—Printing trade generally well employed.
LONDON.—Printing trades steady. Bookbinding slack. Fifteen trade societies, with 19,055 members, have 849 members unemployed.
MANCHESTER.—Letterpress bad, 5 per cent. unemployed. Lithography slack. Bookbinding dull.
MIDDLESBORO'.—The printing trade is unchanged.
NEWCASTLE.—The whole trade maintains its steady position.
NORWICH.—Letterpress slack. Lithography fair.
NOTTINGHAM.—Letterpress fairly good. Lithography moderate. Bookbinding quiet. Artists not well employed.
OLDHAM.—The trade is steadily employed.
PLYMOUTH.—Letterpress improved. Lithography moderate.
SHEFFIELD.—Printing trades very slack. Letterpress 10 per cent.; bookbinders 8 per cent. unemployed.
WOLVERHAMPTON.—Letterpress slack, with 3 per cent. unemployed.

DERBY.

THE lithographic trade is very good. For some weeks past a majority of the members of the trade have been working overtime. The collotype trade is also in a flourishing condition.

ON Saturday, July 13th, Mr. H. H. Bemrose was elected M.P. for the Borough of Derby. (B.L. No. 2 contains some particulars of the famous Derby firm, of which Mr. H. H. Bemrose, M.P., is a member.)

A LARGE number of the members of Messrs. Bemrose & Sons', Ltd. (Chetwynd-street) Rambling Club had their first trip for the season on Saturday

afternoon, June 1st, the place selected being Whatstandwell. The party left Derby by train at 1-55, arriving at Whatstandwell at 2-35. After an enjoyable walk to Homesford, a cricket match was played between the litho department and sundry combined departments. At five o'clock tea was partaken of and thoroughly appreciated. After tea, the weather which had previously been threatening became showery, nevertheless various parties indulged in short rambles which were much enjoyed, whilst the remainder entertained one another with music and song. Later on the party re-assembled at Homesford Cottage, and after more vocal and instrumental music and the customary vote of thanks, a start was made for Whatstandwell about 8-30, arriving at Derby at 10-20, having spent a very enjoyable afternoon.

For the second outing of the season a visit was made to Alton Towers. Leaving Derby by the 2-50 train, the party arrived at Alton at 3-45, and at once entered the grounds of Alton Towers, the magnificent mansion of the Earl of Shrewsbury. About 5-30 the party assembled for tea at the Pavilion. After tea the gardens were again visited, and later on many enjoyed themselves with dancing at the Pavilion. The return train left Alton at 8-55, and arrived at Derby at 10 o'clock. The weather was all that could be desired, and a thoroughly enjoyable afternoon was spent.

Answers to Correspondents.

In reply to Messrs. Duxbury & Sons, we should recommend them to make full enquiries, in reference to the pentagraph, from Messrs. B. Winstone & Sons, 100 Shoe-lane, London. Messrs. O. König & Co., 27 Cross-street, Finsbury, London, have also a fine assortment of engravers' tools. The india-rubber pentagraph (Fougeadoire's), for enlarging and reducing by transfers, is sold by Messrs. B. Winstone & Sons.

In reply to Mr. John Henry Smith, we should recommend that all enquiries for the geometrical lathe be sent to Messrs. Winstone and König as above. Your second question is very difficult to answer, but we ask our readers to supply us with the names of well-known firms—the best, if possible—who engrave by machine the bank-note work for the trade, and specify those who do "white-line machine engraving."

"H.R.," who enquires concerning a supply of grained bitumen plates for photo-colour work, is advised that these may be easily made by the aid of a graining box and hot plate—both inexpensive articles. A photogravure firm might possibly supply a few plates, but it would be preferable to make them at home, and far cheaper. Write Messrs. Penrose & Co., 5 Amwell-street, London, E.C., for particulars and price of apparatus.

Marcus Ward & Co., Ltd., Prize Competition.

We learn that the promoters of this competition are much gratified with the number and quality of the designs sent in. More than a thousand drawings have been received. In awarding the prizes, they have selected those designs which are the best from their point of view, and many beautiful drawings have been received which, as pictures, rank as high in artistic merit as some of those which have obtained prizes. The first prize (£50) has been awarded to Mr. Frank Hobden, Riversden House, Strand-on-Green, Chiswick, London, W. There being several sets of designs of equal merit from which to select the second prize, it has been found necessary to amalgamate the second and third prizes, and to divide the amount (£40) into three prizes of £13 6s. 8d. each, which have been awarded to Miss Jessie Watkins, 96 Portsdown-road, London, N.W.; Miss M. S. Pickett, 62 Marmora-road, Honor Oak, London, S.E.; and Miss G. Homan, 4 Regent's Park-road, London, N.W. The fourth prize (£10) has been awarded to Mrs. Arthur Gaskin, Olton, Warwickshire. The fifth prize (£5) to Mr. Ernest W. Hazelhurst, 72 Burnt Ash Hill, London, S.E.

It is said that Mr. Whistler is now working upon a series of lithographs, happily entitled "Poems in Stone," to be published in the near future. As an etcher Mr. Whistler certainly takes a place in the front rank; he has yet to demonstrate his facility in lithographic work. It is not stated whether he sketches directly on the stone; if he does not some breezy interviews will occur between him and his translator; of that there can be no doubt.

The Bank of France is about to issue a new series of notes of the value of one thousand francs, printed in four colours, the prevailing tints being red and bistre (a brown pigment), and it is believed the forging of this note will be an impossibility, at least by photography.

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